The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

VOL. XXVIII. June 3, 1933 No. 727

Notes and Comments

Finance and Industry

THE future holds, to those who are able to regard it through reasonably optimistic spectacles, far more hope than it did even a few months ago. Many of the concerns whose annual meetings are new being reported in the financial papers are proving to have made increased profits even in a difficult year. They are firms which have adapted their methods to suit the times. Sir Eric Geddes, in his speech at the Dunlop Rubber Company's meeting, remarked that he had found a definite improvement in this country in foreign export trade, and particularly in trade with the Dominions, whilst the "resistance to buying is certainly not so strong as it was a year ago." "The Times" reports "a further rise in commodity prices and other signs of an improvement in trade." There is much to be said in favour of the Chancellor of the Exchequer discouraging the purchase by British investors of large interests in British firms now held by foreign investors. This is the time to encourage new ventures, and it is better that money available for investment shall be put into new projects than that it shall merely be transferred abroad.

A short while ago it was argued that money could best be safely invested in insurance companies rather than in industry. It was not satisfactorily explained how insurance companies were likely to obtain a return on their money unless industry was prosperous. It was argued, and with a good show of reason, that in 1928 the investing public put £117,000,000 into capital issues of shares and debentures, which by 1931 had lost 47 per cent. of their value, whilst of 284 companies in which the public invested in 1928, no less than 106 had either been wound up or had no ascertainable value. In such difficult times as those through which we have passed the wonder is rather that 178 compaines, or over 60 per cent., continued in operation, and, by inference, prospered. The change in the international situation that seems likely now that America is prepared to assist in the rehabilitation of the world, may well be regarded optimistically.

Synthetic Homes

THE synthetic home, achieved with the aid of a man-made chemical known and neglected for a century, is reported in our American contemporary "Industrial and Engineering Chemistry." Vinyl resins, it is reported, have now been used virtually for the construction of every part of a three-room apartment in New York City. Part of the research, which has led to the extended development of these resins, was conducted at Mellon Institute; earlier studies were carried out jointly with the Pierce Foundation, set up in 1917 by the late John B. Pierce, president of the American Radiator Co. Vinyl resin castings, each weighing approximately 150 lb., have been made repeatedly and in the course of a year not one cracked, warped, or otherwise deteriorated. They are said to be the largest ever developed from the usual plastic materials. This home-building experiment began when the Pierce Foundation, planning to construct a model home through the development of new methods and the application of modern materials, desired a door and a sectional wall panel. Wood was ruled out and metal was not used because of its weight. A door of hard rubber was attempted, but failed. A co-operative effort was then initiated to solve the Foundation's problem. Using the door mold designed for hard rubber, a vinyl resin door of specified model was cast. The first one was a success and two dozen more were made with equal satisfaction. Large wall panels, measuring 2 ft. 6 ins. by 8 ft. were then made in a specially devised mold and only one out of twenty-five was unusable. The history of vinyl resins goes back to 1838, when the French chemist, Regnault, observed the formation of a white powder when sealed tubes of vinyl chloride stood in the sunlight. In 1872 the German chemist, E. Bauman, made solid white masses "unaffected by solvents or acids" from the vinyl halides. It was not until 1912 that another German chemist, Ostromisiensky, was granted patents on the production of rubber-like masses from a type of vinyl compound. More recently Dr. G. O. Curme, vice-president and director of research to the Carbide and Carbon Chemicals Corporation, conducted extensive studies in the vinyl resins which resulted in the perfection of vinylite, the vinyl resin used in the building of the synthetic home.

Salesmen and Selling

IN a previous issue we commented very briefly upon Mr. C. C. Knight's paper before the National Association for Salesmanship. Among much that, as then pointed out, was admirable, there is much that is debatable. Marketing, as we have frequently said, is not now a matter just of selling as it was regarded in the old days. It is a combined effort by the sales staff aided by the research staff. Since science has so largely come to the aid of salesmanship, it is well that the salesman should take heed of the teachings of science, whether that science be psychology, chemistry, logic or just plain scientific sense. It has been said that the difference between a business man and

a professional man is that the longer a professional man thinks about a problem the more right he is, while the longer a business man thinks the more wrong he is. The intuition of the business man can advantageously be reinforced by the analytical thought of the scientist, even in such a purely mundane matter as salesmanship.

Mr. Knight dislikes hearing his salesmen talk about " my " territory or " my " customers. It is true, as he suggests, that the territory is, theoretically, the firm's. But in taking this attitude he neglects the effect of psychology. There is a wonderful art in letter writing—if only business houses would realise it. The letter, in the hands of the literary man, can be phrased in words that " walk up and down in the hearts of the readers." It can convey in a subtle, living way the intimate relations between the firm and the customer; It can make the customer feel that the firm has his individual interests at heart; it can create a real bond of sympathy. We only recollect one such letter writer in industry—he received over £1,400 a year and was worth every penny of it. Why? Because he neutralised by his letters one of the unconscious difficulties created by the salesman. Without this intimate contact from headquarters, the only contact between the firm and the customer is the salesman. That is *personal* contact. The salesman stands before the customer as a living entity, the firm is a long way off, a rather nebulous affair that supplies goods, and must sometimes be kicked for mistakes. Let sales managers make no mistake; to be a good salesman, with personality, the territory is *his* territory, and it may take a deal of work if the salesman goes to a rival, to get it back again. There seems to be room in most firms for a letter writer of real ability; that appears to be a direction in which salesmanship should next move.

Scientific Method in Selling

We are inclined to think that Mr. Knight put too much value upon salesmen's reports. Advertising, like other of the world's activities, moves in fashions. Just now the fashion is the "questionnaire"; the salesman's report is first cousin to the questionnaire. Both are equally unreliable, unless studied with the calm deliberation of the scientist, when the salesman's report may occasionally yield a gem of real value. One of the things that the average human being cannot or will not do is to speak the truth, the whole truth and nothing but the truth. Any lawyer will testify that his hardest task is to get a clear and accurate statement of fact from a witness. In spite of the solemn warning given to the witness of the pains and penalties that await the prevaricator, he (and she) cannot give a true and accurate account of what passed before his eyes. Even with the best will in the world two average people will place quite different interpretations upon what they have seen. How much more then will the information be unreliable when there is no particular incentive to weigh carefully what is said. The customer will, as likely as not, wish to avoid a long and argumentative interview, so he invents whatever answer he deems most lkely to achieve this object. It may be that he wishes to get a price reduction. What more obvious, then than the answer "We don't buy your goods because someone else has beaten you in price." Is the sales manager therefore to act on this report and urge his principals to cut their prices? The inevitable conclusion is that no one report and no one answer to a questionnaire are reliable. Yet in their wisdom the salesmen believe that if they can secure, say, 10,000 unreliable answers they will achieve truth. There is surely need for the introduction of scientific method into salesmanship, and the sales force should be recruited from the ranks of some of those chemists who are now unemployed.

Radiation and the Chemist

Radiation is properly the function of the physicist but signs are not wanting that it will become a powerful influence in chemical industry. The influence of radiation on the production of vitamin D, for example, is well-known to food chemists and to the medical profession. The curative influence of infra-red radiation, and the effect on the human frame of the various rays that may be emitted by domestic sources of heat has caused certain manufacturers of gas fire radiants to incorporate in the material of the radiants certain substances—zirconia we believe—that give rise preferentially to certain wave-lengths. It has just been demonstrated that the welcome infra-red heating rays pass through pure wool far more readily than through cotton because the wool is the most porous of all fabric materials, being porous throughout, while others depend mainly for their porosity upon the interstices between the yarns. The same is true of ultra-violet radiation. There will in the future be a demand for substances which will yield certain selected radiation, or which will absorb radiation. There will be a demand for the elimination of substances which absorb health-giving radiation. There is such a demand already; rickets is known all over Europe because of the accumulation of smoke in the atmosphere which absorbs ultra-violet rays.

The chemical properties of sunlight have long been studied, but has chemical industry gone sufficiently far in enlisting the help of " artificial sunlight " in accelerating reactions? What for example, of the art of the brewer or the wine grower? " Great wine," writes Warner Allen, " is a work of art . . . . it is a living thing, not a mere chemical composition; like any living organism, it is young, grows old, and eventually decays and dies, the cycle of its life depending on that of the fermentation microbes which bestow on it its nature and excellence." The life, the work, and the death of the fermentation microbes can be intimately controlled by radiation. Why then must the connoisseur wait for the maturing of " 1869 Chambertin " or of " 1868 côte Rôtie " for his perfect wine? To the scientist who discovers the art of controlling perfectly the maturing of wines, there will come a rich harvest. What a field, for example, there is in the United States for a radiation apparatus which will induce the 3½ per cent. alcohol beverage to multiply its alcohol content by ten! When the chemist really gets to work with radiation, it will be no longer necessary for the Perfect Drinker to say with the second book of Esdras (IX, 22) " Let the multitude perish then, which was born in vain; but let my grape be kept, and my plant; for with great labour have I made it perfect."

The Chemist in the Far East

Responsibilities and Opportunities

THE duties of the chemist in the Far East was the subject of a lecture by Mr. Alexander Marcan, F.I.C., formerly Director of the Government Laboratory, Bangkok, delivered before the London and South-Eastern Counties' Section of the Institute of Chemistry on February 15, 1933. Some extracts from this interesting lecture are given below.

IT has to be realised that in the East there is no sharp distinction between the public and private life of the Britisher as there is at home, and that from the moment he has arrived until he steps on the homeward boat, he has been solely, and without intermission, the holder of a certain appointment. The selection of chemical envoys is therefore of vital importance, for many other qualification are necessary besides competency at the bench. In the narrower professional sense, one has to be willing and able to tackle a multitude of problems, which here would be divided amongst specialists, and in an undeveloped country, to be continually on the lookout for new fields of work.

On the subject of laboratory buildings for the tropics it must be emphasised that they should be as cool as possible. To obtain this the sun must never shine directly on the outer walls; verandahs should be provided, the eaves of which act as screens. It is impossible to work in direct sunshine, and blinds or similar shades entail an unbearable stuffiness. With properly roofed verandahs, the windows and doors can remain open in heavy tropical rainstorms. Provision must also be made to exclude wind from the working benches when desired, best obtained by vertically sliding windows. If possible the building should be so orientated that one aspect gets no direct sun during working hours, when a verandah on this wall can be dispensed with, enabling microscopic work to be carried out under the best conditions. The rooms should be lofty, and top ventilation is advantageous. Ceiling fans should be placed so that a portion of the bench of each worker is free from draught. Ovens and muffles should be located under a ventilated hood; and provision must be made for cooling the water supply for use in condensers for volatile liquids. A public supply of gas is a rare luxury; air gas from petrol is a convenient substitute. Stainless steel should be used where possible for equipment. Cheap glass bottles weather rapidly, and all lenses must be kept in desiccators, as a fungus is apt to grow on the inner surfaces of the glass, destroying its optical properties. Owing to high humidity, special precautions have to be taken to keep chemicals and delicate apparatus dry.

A Clearing House for Information

Work on a variety of subjects has been carried out in India and elsewhere in the far-flung laboratories of the chemical examiners, but it has lacked the co-ordination and assistance which it deserves. The busy analyst in the East rarely has opportunities for such work, but if organised, the subject could be placed on a far more satisfactory basis. A certain amount of information may be gleaned from the reports of various laboratories, which deserve more publicity, though fortunately many are abstracted in "The Analyst," but nevertheless a clearing house is required for the Empire and the East in regard to many of the branches of work which fall to the lot of the remote worker. There is a natural diffidence in putting forward methods which are realised to be imperfect, but a known tentative method is preferable to being left to one's own devices. Each country or district has its preponderance of certain classes of work or certain categories of crime, and the chemist becomes expert in a particular field. A committee should be appointed to collect information on methods found satisfactory, for ultimate comparison and publication in one of the existing journals, inviting criticism. Gradually a body of approved methods would be built up; finally, this should be published in book form and revised every few years, being kept up-to-date in the intervals by means of leaflets. The wasted effort and the lack of progress inherent in the present isolation of our workers, are enormous, and such a committee would find many fascinating and useful subjects for research which might be taken up by our universities. As matters are, the best a chemist in the East can do is to be in touch with workers in similar fields.

The commercial community, as well as the Government, should be led into the fold as clients of the laboratory. Besides the more obvious services, in a seaport the examination of damaged cargo is a branch in which the chemist should have his say. The question to settle is the cause of the damage, in order to decide whether the insurance companies are liable or not, and large sums of money may be involved. In the simpler cases it is only necessary to ascertain whether fresh (rain) or salt water was the cause, but there are other factors to consider when it appears that the cargo has not been wetted. Cheaply-finished metallic goods are apt to suffer corrosion merely by exposure to a hot humid atmosphere. An interesting case was the corrosion of aluminium hollow ware, due to the cardboard packing having an alkaline reaction—probably harmless in a temperate climate. Sometimes consignments of milk shipped in very cold weather from Scandinavian ports may arrive with the tins rusty and the labels discoloured, with no report of rain during loading, or of bad weather en route. The moisture may have condensed on to the cold tins from the hot atmosphere of the hold.

Manufacture of Vitamin Extracts

The present era is one of synthetic drugs, but it may well be that the East still has valuable secrets to reveal. The developments of the past, and of the last few years, are encouraging. In the tropics are vast populations, with an intimate empirical knowledge of the vegetable world—a flora far richer in species than that of temperate lands—remote from medical aid, thrown upon their own resources for drugs, of which they often stand in need, who have made a pharmacopœia of their own. A drug which may have been prepared is vitamin B extract for the treatment of beri-beri. The pericarp of the rice grain, removed in the milling, is extracted with alcohol and evaporated in vacuo. The situation is an example of the danger of the uncontrolled adoption of western methods. Those living on hand-milled rice, with a portion of the pericarp still adhering, do not usually suffer from this disease. The chemist utilises the rice polishings, generally sold for pig food, and erects an expensive plant in order to return to the peasant the vitamins of which he was robbed by the modern rice mill. An alliance with the public health authorities should be made whenever possible. The greatest boon we can confer on the East is in the realms of medicine. It is a mistake to consider the peasant in his simple surroundings and with his natural life as healthy: the incidence of malaria, tuberculosis and hookworm is enormous.

Investigation of Raw Materials

Another useful adjunct to a laboratory in a developing country is large-scale plant for the preparation of commercial samples or for the investigation of raw products, such as oil seeds, tanning materials, drugs and essential oils. At the same time, routine manufacturing operations can be carried out. As well as raw materials of interest, there are some manufacturing processes which should not be lightly dismissed as primitive and out of date, without observation. The well-known amylo process for the production of alcohol is of Chinese origin, having been first investigated by Dr. Calmette in Indo-China in 1885. It is worked in many parts of the East, for the production of rice spirit (arrak). Steamed rice is mixed with ground rice husks in small jars, flavouring matters added, and after some days the alcohol is distilled off. The process is inefficient and the product impure, but its flavour is popular. It was found that moulds, secreting enzymes, were present in the husks. Pure cultures were made and the process developed into one of efficiency, which has been widely used on the Continent. The old eastern distilleries are now being replaced by modern amylo plants. The French having been the first to examine the process in the East, they are still to the fore in the construction of the modern plant.

The present-day establishment of modern manufacturing processes in the East offers scope for the chemist. National sentiment objects, for instance, to exporting raw hides and mangrove bark and importing tanned leather, to exporting oil seeds and importing soap, and the popular prejudice in

favour of the locally manufactured product is considerable, whatever economists may preach. The fixed and essential oil industry, soap making, tanning, cement, and metal smelting are industries that are developed early in technical evolution. A general state laboratory in the East corresponds in a small way with the Government Laboratory in England, rolled into one with the Imperial Institute, the Home Office analyst, and several private consultants' offices. Agricultural chemistry, however, is such a large subject as to be independently organised in an agricultural department.

The Paint Research Station, Teddington

Annual Inspection of the Laboratories

By courtesy of the president and council of the Research Association of British Paint, Colour and Varnish Manufacturers, the laboratories at the Paint Research Station, Teddington, were opened for inspection on May 25. Exhibits showing researches in progress included gloss measurement by optical and photo-electric methods; measurement of hiding power by the brush-out, cryptometer and transmeter methods; intensity of colour, colour fading, weathering, etc.

In gloss measurement by the optical method, the gloss is measured by comparing visually the intensities of light reflected specularly from a standard surface (plate glass with a ground and blacked back surface), and from the surface being tested. In the photo-electric method the eye is replaced by a photo-electric cell, and the intensity of light reflected from the standard surface and from the surface being tested is indicated by the respective deflections of the galvanometer. Visual comparison with standard surfaces produced by polishing ground glass to different degrees to give a series of variations from a matt surface to one of the highest polish was also demonstrated. In the measurement of hiding power by the brush-out method, paint is brushed out from a weighed container on to the surface of a piece of linoleum with black and white squares, the number of square feet covered and obliterated by a gallon of paint being calculated from the area covered by the weight of paint used. In using the cryptometer method, the division between black and white portions of a glass plate is covered by a wedge shaped film of paint formed between the lower plate and a clear top plate, and the position of the wedge film is adjusted so that the line of separation of the contrasting background is just obliterated. The transmeter method measures hiding power by adjusting the paint film thickness until it transmits the same amount of light as a film which just produces complete hiding. A whirling table for the preparation of experimental coated panels was another interesting exhibit, the coating material being spread on the panel by hand and the panel then whirled for the necessary time at 1,000 r.p.m. in order to produce a smoother coating than can be obtained by most other means.

Measuring Viscosity and Plasticity

Apparatus for measuring viscosity and plasticity, included the B.E.S.A. U-tube viscometer (British Standard Specification No. 188, 1929); Gardner-Holdt viscosity tubes (U.S. Paint and Varnish Manufacturers Association, Circular No. 128, 1921); British Cotton Industry Research Association's viscometer, a capillary viscometer with pressure reservoir, in which the time is measured for the flow of a known volume of material under pressure through a capillary of known dimensions; the Gardner-Parks molibometer "Ind. Eng. Chem." 1927, *19* 724); and the Michell viscometer, in which viscosity is measured by the time required for a steel sphere to fall from a cup the liquid being present as a film between the surfaces (Brit. Pat. No. 117,234).

Colour fading was demonstrated by means of the K.B.B. fugitometer, where colours are exposed in boxes with vita glass windows, the humidity of these boxes being controlled at 55-60 per cent. by a stream of air which has passed over a saturated salt solution, a carbon arc enclosed in a glass partly transparent to the ultra violet being used as the source of light. Graphs showing fading curves for a number of red lakes, and the derivation of the P.R.S. fastness scale based on the rate of fading; a comparison of the fastness of a range of lakes with different white diluents; and comparison of the fastness of lakes and pigments in different mediums, silicon ester, gelatin and oils, were other features of this research.

A method for evaluating the strength of white pigments by mixing weighed quantities with ultramarine, both being in the form of an oil paste, showed the relative strengths of the main types of white pigments. Bronzing pigments in different mediums were exhibited to show that the appearance of bronze can be enhanced or completely obliterated by the choice of medium and dispersing agents.

One of the physical laboratories is maintained at a temperature of 25 ± 0.02° C. and 60 ± 1.0 per cent. relative humidity by toluene filled tubes operating electro-magnetic controls on gas burners, a wet bulb (for humidity) controlling the gas supply to a small boiler in an adjoining room, from which steam is blown forward when required. In this room abrasion tests are carried out by allowing sand—smaller than 40 mesh and larger than 60 mesh—to fall at an angle of 45° on to a panel coated with the protective material, the weight of the sand necessary to break through to the metal background giving an indication of the durability of the finish. Here there was also a spring balance for determining the rates of evaporation of solvents and thinners, a small dish of copper foil 1.5 cms. in diameter being supported from a cantilever spring balance of steel wire, whilst 0.2 grms. of the test material is inserted in the dish and the rate of evaporation followed from the movement of the indicating thread against the previously calibrated percentage scale. In the Sanderson drying time meter, sand—smaller than 80 mesh and larger than 100 mesh—falls through a cone on to a disc carrying the test material which is rotating at a suitable speed, generally near 4 hours per revolution. The sand cone is traversed ½ in. per revolution by special mechanism, so that a spiral trace is produced, and at the end of the test, sand is found to have adhered to parts which were wet at the time of incidence and not to those which were dry. From the length of the trace, the drying time can then be determined.

Artificial Weathering

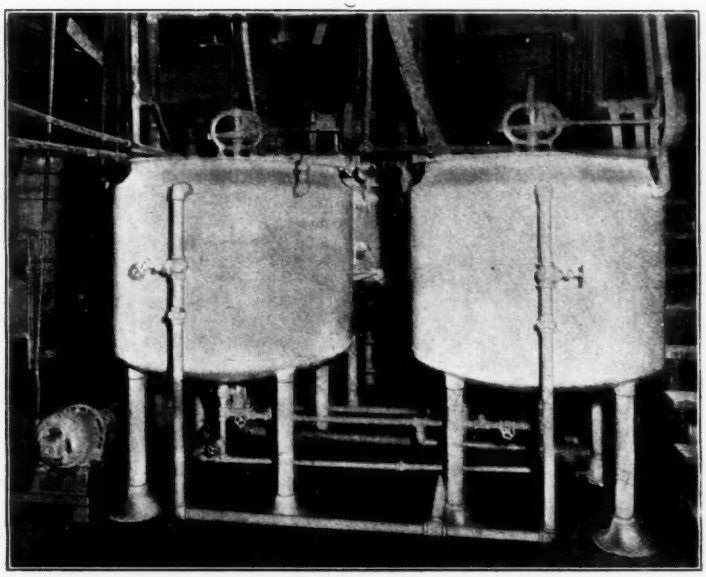
For artificial weathering two tanks are in use. One contains two carbon arc lamps running at 10 amps. and the other contains one lamp at 15 amps. In each tank a water spray is directed along a fixed radius and the tank is rotated three times an hour by a motor, which also drives a small compressor for the spray in which rain water is used, this rain water being pumped from a storage tank through filter beds on the roof of the building from which it is fed to the spray.

Typical exposure panels from artificial and natural weathering tests included comparisons between linseed and tung oil in otherwise equivalent varnishes; comparisons between natural and synthetic resins and also panels showing the effect and type and proportion of plasticiser and resin used in cellulose lacquers. Panels were also shown of weathered films consisting of large percentages of drying oil with small percentages of nitro-cellulose.

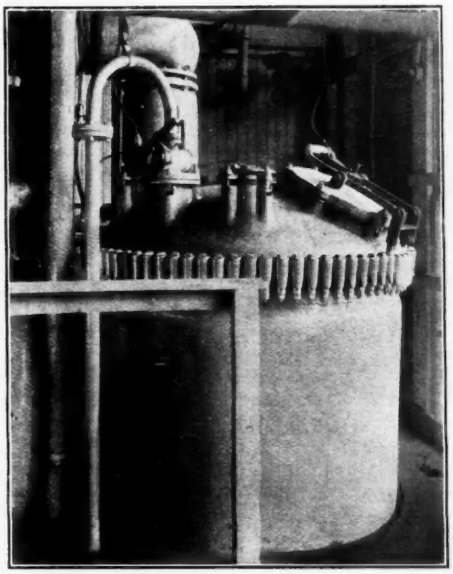
Comparisons between artificial weathering results and natural weathering results shown in the laboratory museum were arranged to illustrate such features as the direction of exposure of panels during weathering, effect of extenders in white lead paint, primers and undercoats with white lead, effect of addition of aluminium powder to lithopone paints, effect of treating the pigment with dispersing agent, effect of varying oil medium in zinc oxide paints, effect of various oils in lithopone paints, weathering of various titanium pigments in linseed oil, antimony oxide paints, ordinary and non-setting red lead, the effect of variation of proportions of white lead and titanium in mixed pigment paints, and variations in medium white lead paints.

During the afternoon, Dr. W. Krumbhaar, director of the Institut für Lackforschung, Berlin, spoke upon the commercial and scientific activities of the paint industry in England and Germany, and also upon chlorinated rubber. His remarks upon chlorinated rubber are reported on page 507.

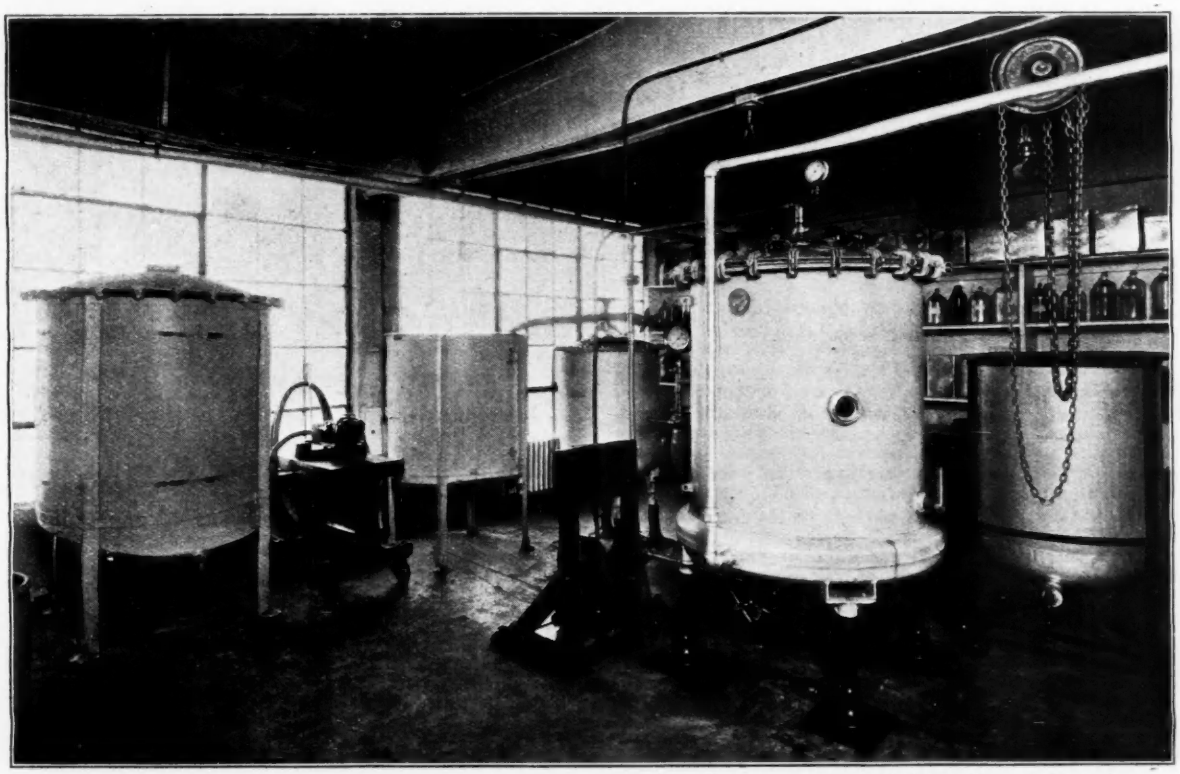
Glass Lined Equipment at Modern American Works



A battery of Pfaudler Mixers at the works of the Larrow-Suzuki Co., Rossford, dealing with liquids containing Hydrochloric Acid. These open type mixers, which are steam or brine jacketed, may also be used for evaporating, sulphonating, heating and cooling operations.



One of the standard Pfaudler Reaction Kettles, as installed at the works of the H. K. Mulford Co., Philadelphia, for Pharmaceutical Products, containing traces of Acid.



Photographs by Courtesy of Enamel'ed Metal Products Corporation Ltd., London.

Pfaudler Glass Lined Equipment is used in this Manufacturing Laboratory of the Styron-Beggs Co., Newark, Ohio. This illustration shows a Percolator for extracting Vanilla Beans and the accessory Alcohol Storage Tanks.

The Increasing Importance of Alumina

Catalytic and Adsorptive Properties

THE oxide of aluminium is attracting continued attention from technologists, not only as the basic material for the manufacture of aluminium, but also as a constituent of refractories and abrasives and for its catalytic and adsorptive properties. Corundum and emery, natural forms of the oxide, are now made on a considerable scale in the electric furnace; while the hydrated forms are worked up as the major sources of alumina in the industries. In one method bauxite is treated by furnacing with soda to give sodium aluminate, which is removed by leaching, while a second process involves heating under pressure with caustic soda, followed by precipitation of the hydrated oxide with carbon dioxide. An alternative method of liberating the product is to precipitate it by addition of aluminium hydroxide itself, this causing a large proportion of the alumina to collect, while the mother liquor is used for further extraction of bauxite. From leucite, which is the siliceous form of importance to Italy, the alumina is produced by furnacing with limestone and leaching the product with a soluble carbonate, followed by decomposition of the aluminate.

Manufacture in the Electric Furnace

Among several electrothermic preparations is that of Hyland in which impurities are removed with carbon in the furnace and the alumina recovered as a slag, the latter being crushed and hydrolysed. A second important one, which is a modification of Hall's process, consists in removing metallic impurities as an alloy of iron aluminium, silicon and titanium, the molten alumina remaining (after tapping off this alloy) being blown by high-pressure air or steam into small hollow granules. Subsequent leaching of these with a dilute acid gives a product containing 99.75 per cent. Al_2O_3. This method of removing iron and silicon as a ferro-silicon alloy is also employed when the abrasives and refractories known as corundum, alundum, and aloxite, are the desired physical forms of alumina; for bauxite is the raw material and contains little more than 50 per cent. Al_2O_3, the remainder being oxides of silicon, iron and titanium, together with about 25 per cent. loss on ignition. The furnace for aloxite manufacture is a cylindrical steel shell with a floor covered with coke, often with the addition of tar and coal when making other types of corundum. Water cooling is adopted, and the carbon electrodes are fixed vertically from the top; the charging hole is fed gradually with a charge of calcined bauxite admixed with reducing and slag-forming agents. The product obtained as a solid ingot is removed from the furnace, disintegrated, and is screened.

Alumina as used for abrasives has a melting-point of 2,010° C. and a hardness of about 9 (Moh's scale). In a material containing about 97.5 per cent alumina, it is common to find one third of one per cent. iron oxide, 0.9 per cent. silica, and the rest is titanium oxide, the latter often being added when a tough abrasive is desired. For conversion into grinding wheels, crucibles and sharpening stones, the ground material is compounded with various vitrefied bonds and fired in a potter's kiln as in the ceramic industries. Alumina is also an important refractory, being chemically inert towards alkaline solutions and fused silicates, although it is slightly soluble in hot dilute acids. It has been recently shown in this connection that alumina may be made denser and more refractory by burning on the surface of it a mixture of gas and air on the principle of surface combustion.

A Future for Alumina Gel

As an adsorbent, alumina gel has a future which will be no less important than that of silica gel. For long, bauxite has been used to remove impurities from mineral oil by filtration: but this earth treatment is hardly comparable to the high efficiency of alumina gels of 6 per cent. water content. These porous masses are obtained by acidifying sodium aluminate, just as silica gel comes from sodium silicate. Activation and re-activation are brought about by heating with air or superheated steam, and it has been stated in Canadian research laboratories that re-activation may be repeated 1,000 times without deterioration. For the drying of air in conditioning or for blast furnaces the alumina gels are equal to silica gels, while high efficiencies have also been demonstrated in the dehydration of ammonia, hydrogen, oxygen, carbon dioxide, and chlorine. Selective adsorptions are also shown in the recovery of benzol, ether, carbon tetrachloride and gasoline vapours, from vapours plus gas mixtures, and also of hydrogen sulphide from carbon dioxide and chlorine from hydrogen. Up to a point when the gels have increased by 12 per cent. in weight, moisture is eliminated from gases with 100 per cent. efficiency; and, if lower efficiencies are permissible, then adsorption will continue until 25 per cent. increase in weight has occurred. A gel activated at 300° to 400° C. is useful for elimination of sulphur compounds from petroleum, and even better results are obtainable with combinations of alumina and silica gels.

As a catalyst in organic chemical reactions alumina has been prominent since the pioneer work of Sabatier and of Mailhe. Here, again, future developments will certainly appear as the reactions in the laboratory assume industrial importance. When phenol vapour is passed over alumina at 400° to 450° C. diphenyl oxide is formed and is used in the perfume industry as an artificial geranium odorant. During the war acetone was manufactured in one process by passing acetic acid vapours over alumina at 500° C., the oxide being precipitated on a porous granular support. It is the glut of acetone made by fermentation methods, and the increased use of methyl acetone from wood distillation in place of acetone, and not lack of efficiency in the catalytic method of preparation, which explains why this method has been suspended. Any future demands for aldehydes will certainly be met by a similar use of the catalyst, the vapours of formic acid and of a second aliphatic acid being used together in equimolecular proportions.

Interconversion of Alcohols and Olefines

Although there are two major sources of ethylene at present, viz., extraction from coke oven gas, and, in America, from the cracked gas of the petroleum industry, yet increased demands in the future will attach greater importance to the manufacture of ethylene from alcohol. With the demand for ethylene bromide in the production of ethyl petrol, America explored all possible sources of bromine, both in bitterns and by that amazing cruise of the s.s Ethyl for extracting the halogen from sea-water. At the same time, ethylene came into prominence and the catalytic production became an established commercial process, for at 340° to 360° a conversion of 98.5 per cent. is obtained with alumina, a value which equals the yields using more expensive tungstic oxide. Similarly, butyl alcohol gives butylene, so that the conversion of alcohols into hydrocarbons of the olefine series by use of alumina as a catalyst, and the reverse change using sulphuric acid, are reactions awaiting a wider development.

Polish Chemical Industry

Expansion Despite Adverse Trade Conditions

DESPITE the adverse trade situation, the Polish chemical industry in 1932 demonstrated continued initiative in the introduction of products not hitherto manufactured in Poland. Following a series of investigations intended primarily to improve manufacturing methods, a number of chemicals hitherto imported have been manufactured locally. Thus, the Tomaszow rayon factory started the production of Glauber's salt and calcined anhydrous sodium sulphate. The same manufacturer has likewise taken up the production of "tomophane," a commercial name for the cellophane produced at Tomaszow, recently discontinued by the "polophane" plant in Pomorze. The firm "Kabel," of Krakow, is reported to be the first Polish manufacturer of synthetic phenolic resins, and the firm Roman Maj of Poznam the first producer of iron base pigments. "Polchem," of Torun, is setting up a special department for the manufacture of carbon disulphide and the Belgijski Sp. Akc., Zaklady Przemyslowe Boryszew, has engaged in the production of different vitamin pharmaceuticals. Ferrochrome, artificial corundum, carborundum, ferromangan-silicon, ferrophosphorous, ethylene trichloride, and cocaine were also produced during 1932.

No Illusions About Chlorinated Rubber

By Dr. W. Krumbhaar, Director, Institute für Lackforschung, Berlin

ABOUT two years ago chlorinated rubber was first suggested as a basis for the production of paint media. All paint and varnish men were very interested in it and in spite of its high price the material was tried out in an enormous number of tests all over the country. It was thought that chlorinated rubber would prove to possess all the good properties of rubber without the unfavourable features which make ordinary rubber unsuitable to painting technique.

In Germany to-day, four different kinds of chlorinated rubber are available which differ only slightly from one another; in outward appearance they usually resemble sawdust but with a slightly yellower tone, although one type assumes a very voluminous, loose wadding-like form. Good quality material gives fairly clear and water-white solutions. Suitable solvents are benzol, toluol, xyol and solvent naphtha. The viscosity of the solution is dependant on the chlorine content of the rubber and decreases with increasing chlorine; in general a solution in toluol containing 20 per cent solid content has lacquer consistency. The disadvantage of having to use these solvents arises, as is well known, from the fact that they cause undercoats of all kinds, especially red lead, to quickly soften and lift; in addition they are not very much in favour with the painters on account of their action on health and nose. Tetralin also possesses solvent power for chlorinated rubber but it remains behind in the film so that even after several days such paint will not be really dry. Ester-like compounds dissolve chlorinated rubber to a certain extent and, therefore, may be added to ordinary solutions made with benzol hydrocarbons and so on, but practical use is made of this method only exceptionally. Chlorinated rubber, however, is nearly insoluble in alcohol and petroleum hydrocarbons, so that very small quantities only of these materials may be added successfully to ordinary solutions of chlorinated rubber; brushing properties and smell may be improved a little by so doing.

Characteristic Properties of Dried Films

Dried chlorinated rubber solution, that is, the simple chlorinated rubber film, possesses no elasticity and is brittle. Unfortunately the essential features of rubber are lost by chlorination, and it is obvious that this kind of film would possess no weather resistance. In fact, such film completely crack and flake after a few months only of outside exposure. Further, the adhesion of films of plain chlorinated rubber is very poor; they detach themselves immediately from polished metal and can be easily be removed from surfaces not really rough. Most painting faults of chlorinated rubber paints arise primarily from bad adhesion, and this weakness is accentuated by another property, which of itself is a matter of merit, namely, the impermeability of the film to gas and water. A pure chlorinated rubber film is, equal thickness being assumed, from 5-10 times less permeable to vapour than a linseed stand oil film. The permeability of such films can be measured and compared by following the loss of weight from a cylindrical vessel containing water into a vacuum desiccator over concentrated sulphuric acid through a film of the material closing the vessel. Such measurements show that films of chlorinated rubber are reasonably but not absolutely impermeable to vapour. Thus the protective action of films of chlorinated rubber due to low permeability against water vapour and gas is not absolute but a question of time.

The resistance of pure colourless chlorinated rubber films against water, that is, their swelling resistance, is relatively small, thus when dipped in water, they very quickly become white. Resistance to water and aqueous solution of alkali and acids only developes when the film is pigmented. Resistance against solvents naturally corresponds to the solubility of the chlorinated rubber; thus the film is only resistant to alcohol and mineral spirits, and not against benzol and other hydrocarbons of this kind. Chlorinated rubber films do not burn with an open flame when in contact with fire; they only char, but this property does not hinder the film from being destroyed by fire.

A question which is particularly important from the standpoint of use is the stability of the chlorine combination in the chlorinated rubber molecule, or, in other words, the degree of action of heat and light on the splitting off of chlorine compounds. You have to bear in mind that this material contains at least 65 per cent. of chlorine, *i.e.*, a very high amount. Practical tests show that there is no complete stable chlorinated rubber. It easily decomposes at temperatures of 150° C. and this decomposition by heat is fairly rapid even at 100° C. If, for example, a chlorinated rubber film is heated in aqueous silver nitrate solution, silver chloride is formed, or if a chlorinated rubber-toluol solution is heated to boiling point and blue litmus paper is placed in the vapour, the litmus paper becomes red, usually about after five minutes. A pure chlorinated rubber film is showing signs of decomposition at ordinary temperatures under the action of a mercury vapour lamp or a bright incandescent are in the course of a few hours. Bright copper plate painted with chlorinated rubber solution discolours to a greenish black when exposed to the rays of these lamps. On the other hand it must be stated that the film itself, on exposure, does not yellow or discolour. Whilst pure chlorinated rubber is, therefore, not completely stable to light and heat, it was earnestly and to some extent successfully tried, to make it stable for use in paints by combining it with suitable substances.

Nitrocellulose cannot be considered as a suitable addition, for it is quite incompatible with chlorinated rubber. On the other hand, the usual plasticisers have proved to be satisfactory, particularly dibutyl phthalate, of which, in general, 5-8 per cent. is used. Chlorinated diphenyl and certain chlorinated naphthalene are also recommended, although from their compositions they might share the possibility of splitting off chlorine. The elasticity and weather resistance of chlorinated rubber can be considerably improved by the addition of plasticisers; in particular, a high resistance to blows can be imparted, a property which has significance for the painting of iron pipes. The permeability, swelling resistance and adhesion of the film is scarcely affected by the addition of less than 10 per cent. plasticiser; the stability against light and heat however is considerably improved. Higher additions than 10-15 per cent. are not desirable, since thereby the chemical resistance against alkali and acid is reduced to a very considerable extent and thus the most important feature of chlorinated rubber is destroyed.

Resins and Drying Oils

Satisfactory products are obtained by combination with certain soft synthetic resins; also with soft coumaron resins and soft bitumen or tar. In such combinations the brittleness and poor adhesion of the chlorinated rubber is overcome without the chemical resistance being at the same time markedly reduced. Soft phthalic acid resins are particularly suitable for this purpose, for instance, the resins that can be easily produced according to the old American Arsem patents and indeed an addition of 20-30 per cent. of them is sufficient. Hard resins are not suitable for this type of combination since, on account of their own brittleness, they cause an increase in brittleness of the film. The problem of combining chlorinated rubber with drying oils, for example, linseed oil and tung oil, is also much discussed. Chlorinated rubber decomposes seriously at 150° C., and cannot therefore be heated with oil in the usual way to form a homogeneous body. One can only dissolve it in the oil at 100° C. or add the oil to a chlorinated rubber-toluol solution. In the film the oil acts as a plasticiser but after complete drying it is usual for some brittleness to develop; indeed, these observations hold true for thin linseed oil and tung oil as for the corresponding thick heated stand oils and also for blown linseed oils. Therefore, combinations like these proved a failure in practical use.

Attention has already been called to the fact that the stability of the new material can be increased by the addition of other substances, *e.g.*, plasticisers or resins. The pigments also have a considerable stabilising effect and, indeed, not only those which combine with hydrochloric acid, such as zinc oxide, aluminium, red lead, but also the indifferent

pigments such as carborundum, iron oxide, microabestos, etc., the reason for this stabilising effect may be that they partially function as protectors against light. Thus, it is obvious that pigmented chlorinated rubber films are more weather resistent than clear films. At the same time the addition of pigment reduces the swelling properties of the film considerably, and, therefore, a correctly pigmented chlorinated rubber film will not swell practically in water and aqueous solutions. The adhesion of films to the painted surface is, however, by no means improved by pigments, not even by a sharp edged and very hard pigments such as carborundum On the other hand the resistance to blows of chlorinated rubber films is markedly improved by pigment mixtures of silicon carbide and microasbestos. Obviously for acid and alkali resistant paints only those pigments which are themselves not attacked by acid and alkali must be used.

Necessity for Correct Combination

From these remarks it is seen that on the basis of chlorinated rubber *in correct combination with suitable soft resins and pigments* a paint can be obtained which is very water resistant, unusually resistant to chemical and mechanical influences, and also non-inflammable. The practical uses of such paints are, however, unfortunately very limited. On account of the softening action of the solvents on under-coats these paints cannot be applied by brushing to surfaces which have been primed in the usual way, whilst the spraying of chlorinated rubber paints is not usually possible since the material forms web-like threads in the air. This great disadvantage cannot be overcome by varying the spraying equipments or by choice of a lower viscosity material and can be improved only to a very small extent by the addition of suitable resins or the use of higher boiling solvents such as turpentine.

Chlorinated rubber paints again are, on account of non-inflammability, suggested for painting wood; there are, however, scarcely any advantages in this use. The danger of fire with wood is reduced by any paint in which paint hinders the drying out of the wood, by closing the pores and by making the surface smooth. They can be used on gypsum plasters, cement and stone, when special acid resistance is desirable, but paints of the usual consistency do not penetrate very deep into the pores of plasted surfaces; they are, therefore, economical in use, but, on the other hand, the adhesion to the surface is not very good. They can, however, always be used as paints for metals, especially iron where no particular weather resistance, but good resistance against chemical action is required. The difficulty here lies in the proper previous treatment of the iron surface, which, above all, must be sufficiently rough for the paint to adhere. The adhesion of the rubber paint to pipes of the usunal kind, where the surface is rough, presents no difficulties and the good resistance of the paint to blows is of particular advantage during transport of the pipes. Large quantities of chlorinated rubber paints have been used for pipes. After the painted pipes have remained in the damp ground however, in many cases corrosion occurred; the rusting started especially in small spots, probably due to the splitting off of hydrochloric acid. The first corrosion is gradually increased by the attack of electrical currents.

A Few Special Uses

From this it can be seen that there are "no illusions about chlorinated rubber." The word "rubber" connected with the introduction of this new product has exerted a suggestive action and has roused more hope than could be fulfilled. The first illusion concerns the elasticity, flexibility and weather resistance; the second goes about the impermeability to vapour and the adhesion; the third point is the swelling properties and the resistance against alkali; the fourth, that of acid resistance, of rust prevention and the protection of cement and stone; the fifth is the idea that a special fire protection could be obtained for wood and fabric; and the sixth and seventh illusions are those about the stability against heat and light and about the resistance against solvents. Without doubt there are a few special uses for chlorinated rubber, and in these cases, when suitably combined and used correctly, the material answers the purpose as satisfactorily as other materials.

Society of Chemical Industry

Annual General Meeting of Food Group

THE report of the hon. secretary, Professor H. Raistrick, presented at the annual general meeting of the Food Group of the Society of Chemical Industry, on May 26, showed that the membership of the Group had grown to 294, an increase of 131 during the year. A longer programme than the committee would consider desirable in any but a first year had been carried out successfully. Many of the meetings had taken the form of joint meetings with other bodies or with local sections or groups of the society. Nine meetings have been held, and two extra meetings are to take place before the session closes. In one case at the annual congress of the Royal Sanitary Institute, to be held at Blackpool from June 17 to 24, the Food Group has undertaken the organisation of Section "F," dealing with the hygiene of food; here Dr. L. H. Lampitt, chairman of the Food Group, will preside over a joint discussion on the wrapping of bread and butter. Secondly, at the annual meeting of the Society of Chemical Industry at Newcastle, the Food Group is organising a session, on July 13, when Sir John Russell, F.R.S., will open a discussion on "How Science can Help the Nation to Improve its own Food Supply."

Part of the programme for the 1933-34 session has been arranged, and includes joint meetings with the Physiological Society, in London, and with the Chemical Engineering Group and Yorkshire section of the Society at Leeds. On November 23 and 24, there is to be a two days symposium in London on "Bread" and "Milk." The proceedings would be followed by a dinner at the Russell Hotel.

For the ensuing session of the Food Group the following remain in office:—Chairman, Dr. L. H. Lampitt; vice-chairman, Mr. B. G. McLellan; hon. secretary, Professor H. Raistrick; treasurer, Dr. H. E. Cox; committee, E. B. Anderson, J. B. Cronshaw, E. B. Hughes, D. W. Kent-Jones, H. J. Page, T. Rendle, T. Moran and J. Stenhouse. Professor J. C. Drummond and Mr. Osman Jones were elected by the committee to fill two vacancies; the remaining two vacancies were filled by Mr. A. L. Bacharach and Mr. J. W. Corram, who were elected by ballot.

Knowledge on the Neutron

Dr. J. Chadwick Delivers the Bakerian Lecture

THE neutron was the subject of the Bakerian Lecture delivered to the Royal Society, by Dr. J. Chadwick, F.R.S., on May 25. Neutrons, said Dr. Chadwick, can be liberated by the bombardment of several light elements by α particles, but, except from beryllium and boron, the yield of particles, is very small. In some cases the nuclear reactions seem quite clear, and the experiments are consistent with the conservation of energy and momentum in the reactions. In the case of beryllium, however, it appears at first sight difficult to account for the whole of the energy available in the disintegration. The possible occurrence of another kind of neutral particle of much smaller mass than the neutron has sometimes been suggested, but experiments have so far failed to detect it.

From the data now available it is possible to fix fairly close limits for the mass of the neutron. The mass is consistent with the view that the neutron is a complex particle formed by the union of a proton and an electron. Other arguments suggest that the neutron is an elementary particle. As an alternative, one might suppose the proton to be complex, consisting of a neutron and a positive electron, but this view also has certain difficulties. Experiments on the passage of neutrons through matter were examined. The interaction of neutrons with atomic nuclei can be explained in a general way, but some interesting points appear in the collisions with the lighter nuclei, in particular with protons. In some cases inelastic collisions have been observed in which the atomic nucleus is disintegrated. When the radiation from beryllium consisting of neutrons and γ rays, passes through matter, positive electrons are occasionally produced. It is not yet known whether these are due to the action of the neutrons or to the γ rays.

Industrial Diseases of the Skin

Recommendations for their Prevention

SOME of the measures recommended by public authorities and developed by manufacturers for the prevention of industrial diseases of the skin were outlined by Dr. H. Haldin-Davis at a joint meeting of the Metropolitan branch of the Society of Medical Officers of Health and the Food Group of the Society of Chemical Industry, held at the London School of Hygiene and Tropical Medicine, on May 26.

The chief industrial diseases of the skin, said Dr. Haldin-Davis, were anthrax, the most dramatic and perhaps the least common; cancer of the skin, which might be due to several different causes; and trade dermatitis. Not less than 15,000 cases of dermatitis were certified by factory surgeons every year, and there was hardly any trade in which the workers escaped it altogether. Among the workers most frequently attacked were engineers, bakers, flour and sugar confectioners, french polishers, workers in the fur trade and in the chemical and dyeing industries. Dermatis is a compensatable disease, but not a notifiable disease. The only notifiable cutaneous diseases are anthrax; epitheliomatous ulceration due to tar, pitch, bitumen, mineral oil or paraffin; and chrome ulceration. Anthrax is quite amenable to treatment if diagnosed early, and a precautionary card, devised by the Home Office for use in such industries as were liable to give rise to anthrax, was given to any workman who developed a pimple or sore; this was taken to the doctor when a man presented himself for treatment, and it constituted a very tactful method of suggesting to the doctor the possibility of anthrax infection and hence securing the all-important early treatment.

It has been thoroughly established that those most likely to be affected by skin cancer were mule spinners, and workers concerned in the distillation of coal tar, the manufacture of patent fuel and the refining of paraffin oils. Full information was given in the report on epitheliomatous ulceration among mule spinners, published by the Home Office in 1926. Precancerous conditions of the skin and the early stages of cancer itself affecting the skin were very amenable to surgical treatment. In order that medical inspection should be efficient, this report recommended that it should take place at the factory every four months, should include every worker over thirty years of age, and should be performed by specially-appointed medical men. The recommendations, although adapted for mule spinners, were applicable, when appropriately modified, to other individuals working under conditions liable to produce epithelioma of the skin.

Chromium Plating Works

The only other notifiable disease of the skin was chrome ulceration. Chromium compounds were extremely dangerous to the skin and mucous membranes; they produced definite ulcers on the skin, known as "holes," and a very characteristic lesion was perforation of the nasal septum. The production of these "holes" was greatly encouraged by any slight abrasion or scratch of the skin, and they could be produced very quckly. Considerable lesions sometimes occurred after a single day's work in a chromium plating factory. Where chromium was employed in an electrolytic bath it was the heavy fumes which caused damage to the nasal septum. The regulations of the Home Office were directed to (1) the provision of an efficient exhaust draught to carry off the fumes; (2) maintaining the floors of the workrooms smooth so that no pools of corrosive liquid could collect, and impervious so that the liquid could not drip through to rooms beneath and thus attack other workers; (3) the provision of protective clothes, including rubber gloves, boots and aprons; and (4) convenient lavatory accommodation, including a supply of hot water.

Ordinary trade or eczematous dermatitis was common in a great number of trades, but was probably most troublesome in the food industry, among bakers, confectioners, jam and preserve makers, etc. Those concerned with industrial dermatitis were agreed as to the most important means of prevention. The first was the selection of the personnel to be employed. In all the best factories in which food was handled the skin of candidates for employment was examined carefully before they were engaged, and all who had any active skin disease or whose skin showed any marked departure from the normal were excluded. In particular, any degree, however slight, of ichthyosis predisposed the skin very markedly to dermatitis. In one factory not only was the skin of the hands and forearms carefully inspected, but also that of the feet and toes; any tendency to scaliness and exfoliation of the epidermis in these regions caused the possessor to be rejected. The next step was to ensure that the conditions of employment were as favourable as possible. In certain trades employers were compelled to provide workers with proper facilities for washing, including an adequate supply of hot water.

Constant Medical Supervision

Constant supervision was extremely important, for it enabled skin troubles to be detected at a very early stage, when they were still amenable to treatment. Dermatitis usually started as a dry erythematous patch either in the interdigital folds or on the extensor aspect of the fingers or hands, and, as a counsel of perfection, any worker exhibiting it in the slightest degree should be immediately removed from the work which might have excited it. Dr. Howard Mummery, chief medical officer to one of the largest food-producing firms in the country, emphasised removal from the influence of the irritant, and the prohibition of washing while any sign of dermatitis was present. The best application for treatment he had found to be an ointment containing zinc oxide 2 dr., starch 2 dr., vaseline ½ oz., with the addition of 40 mm. liquor picis carbonis. The patient was ordered to rub this thoroughly into the lesion. Dr. Haldin-Davies said that he personally had found that it was better, in treating dermatitis cases, to omit the liquor picis carbonis; but, of course, he saw only the worst cases, in which much damage had already been done, and in which a stimulating preparation such as liquor picis carbonis was prone to increase the inflammation, whereas Dr. Mummery saw the cases in their early stages. In some factories lavatory basins with hot and cold water laid on were provided within a few yards of the machinery, so that adhesive substances such as dough or sugar could be washed off without delay before they hardened on to the skin, and without the use of special solvents. The use of gloves for the prevention of dermatitis was hardly practicable in food trades such as had been mentioned, but they were of use in certain occupations. Rubber gloves were suitable only under certain conditions; their outstanding characteristic was their impermeability to water, and thus they protected the skin from its action, but they also prevented the evaporation of sweat, and consequently, if worn for more than a few minutes, tended to cause the hands to become moist and sticky from the accumulation of perspiration, which was itself a potent irritant and a frequent cause of dermatitis.

Skin Protecting Mediums

In some trades the hands became soiled with very adherent material, and special solvents were sometimes recommended for its removal. For example, the Home Office recommended, for the removal of oil, a wash containing chlorinated lime (powdered) 175 grams, sodium bicarbonate (crystals) 360 grams, boracic acid (powdered) 35 grams, and water up to 30 oz. For use this was diluted with 10 volumes of water; its use was to be followed by a thorough rinsing with soap and water. Better than the use of special solvents was the preventive treatment of the hands with a film of material to protect the skin. Rosalex, of Manchester, working in harmony with the Home Office, had produced at least two very useful preparations for the prevention of dermatitis. One was non-greasy and was made up with glycerine and starch and other substances, whilst the other was greasy and consisted largely of lanoline. Both were put up in containers to be hung on a wall bracket, and fitted with a knob, one turn of which released sufficient of the mixture to coat the hands with a thin protective film. It prevented to a great extent noxious substances from coming into contact with the skin, and also enabled them to be removed more easily without friction.

The Institution of Gas Engineers

Mr. R. E. Gibson's Presidential Address

THE seventieth annual general meeting of the Institution of Gas Engineers was held at St. George's Hall, Liverpool from May 30 to June 2, under the presidency of Mr. Ralph E. Gibson, chief engineer of the Liverpool Gas Company. Mr. F. P. Tarratt, chief engineer of the Newcastle and Gateshead Gas Company, was appointed president for the ensuing year.

Mr. GIBSON, in the course of his presidential address, recalled the fact that the last time the Institution met in Liverpool was nineteen years ago, just two months before the outbreak of the war. Since that time, he said, the gas industry had advanced considerably in technical knowledge, in improved methods and in greatly increased output. The membership of the Institution had increased from 875 in 1914 to 1,407 in 1933, whilst its prestige and status was recognised by the grant of a Royal charter in 1929.

The depressed condition of trade and the vast amount of unemployment had naturally had an adverse effect on the development of gas sales, but the gas industry had not suffered to the same extent as the majority of the industries of the country. The development of the uses of gas for industrial and commercial purposes had lately received special attention. The scheme now being completed under the auspices of a joint co-ordinating committee of the three central gas organisations would, it was hoped, result in a large increase of business. It was essential, however, that the scheme should receive the whole-hearted support of every gas undertaking in the country, whether situated in an industrial area or not. More important than the necessary financial support was the co-operation of everyone concerned, and the utilisation of the facilities which would be afforded by the establishment of district development centres and the co-ordinating department at headquarters in London.

Industrial Development

This movement was not solely a large scale industrial gas campaign. It was one which embraced the application of gas for every conceivable purpose for which gas was suitable, including the requirements of bakeries, catering establishments, and the heating of public buildings. If the opportunity which the scheme afforded was neglected much business might be irretrievably lost. In developing the use of gas for industrial and commercial purposes, the price at which gas could be supplied was an important consideration; in fact, the price was in many cases the deciding factor in the securing of business against competition. The bringing down of manufacturing and distribution costs should be the constant aim of every gas engineer and manager.

The price of oil had been so low during the last few years that it had gained a strong position as a competitor with gas and other forms of fuel for heating purposes. The view held by the gas industry generally was that oil, being of foreign origin, should be taxed, as it entered to a considerable extent into competition with home-produced materials, such as gas, coke, and creosote, etc. Those who held that opinion would have been pleased with the action of the Chancellor of the Exchequer in proposing an import duty of 1d. per gal. on heavy hydrocarbon oils, including fuel oil, gas oil, Diesel oil, lubricating oil and kerosene, together with an excise duty of 1d. per gal. on oil of that nature in stock on April 25. The imposition of the tax would place a serious financial burden, however, on undertakings making carburetted water gas. Cheap supplies of gas oil had enabled gas undertakings to manufacture carburetted water gas at low cost and, at the same time, to dispose of large quantities of surplus coke. It was not improbable that the price of coal might tend to rise as a result of the increase in the price of oil. It must also be borne in mind that oil was competing with electricity and the other forms of fuel with which the gas industry had to compete.

The bulk of the petrol used in this country as motor fuel was of foreign origin. The great petrol supply companies had served the country well, but it was increasingly evident that the matter should be looked at from the national point of view. Home-produced motor fuel should have preference if our country was to rely less upon supplies from abroad. The National Benzole Co. had rendered good service to the nation in general and the gas industry in particular by marketing National benzole mixture, largely a home-made product. A considerable increase in the production of benzol by stripping coal gas had been a notable feature of the past year. Developments in the use of bottled gas and of creosote as motor fuels held great possibilities for the near future. The practical difficulties in using compressed gas seemed to have been overcome. Steel cylinders had been produced sufficiently strong to withstand the high pressures required and were not unduly heavy. The results so far obtained seemed to be highly satisfactory, and the general adoption of compressed gas, involving the provision of compressing stations, appeared to be largely a question of time.

The use of specially prepared creosote as a motor fuel, which originated in Belfast and had been further developed in other towns, held much promise of success, and it was hoped that all the initial difficulties would soon be completely overcome. The quantity of this fuel that could be produced was limited as only a small proportion could be extracted from the creosote. These three alternatives to petrol—benzol, compressed gas, and creosote—should have a beneficial effect on the nation's motor fuel supplies. If half the quantity of petrol imported into this country were replaced by these fuels, a material addition to the resources of the country would be made, and a substantial amount of much-needed employment would be given.

Progress in Hydrogenation

Another interesting development, which held possibilities for the future, was the hydrogenation of coal, tar and creosote. The Bergius process for the hydrogenation of coal had been tried out on a working scale and would be commercially successful on a large scale if the prices now ruling for motor spirit continued. If the tax of 8d. per gal. on petrol were removed, however, the process would become practically unremunerative. The future would thus depend largely on the policy of the Government. The quantity of motor spirit obtainable from 100 tons of coal (including the coal required for raising steam and working the process) was approximately 8,000 gal. It would appear that the country's requirements of motor spirit could be met by hydrogenation, in which event there would be a largely increased output of coal and employment for a greater number of miners and other workers. Future developments would be watched with the keenest interest by the gas industry.

Much had been said about the mechanisation of industry being the chief cause of unemployment. In the gas industry, however, unemployment was not to be seen to any serious extent. This was due to the fact that, whilst not neglecting to use every means of cheapening production by adopting modern methods, gas engineers were paying much greater attention to the distribution and service side of the industry, with the result that the additional men employed for this work had probably more than balanced any reduction in the number of men employed in manufacture. The continued success of co-partnership in promoting good relations between employers and employed was a satisfactory feature of many company-owned undertakings. The ever-increasing holdings of workmen in the stock of the companies they served was a potent factor in binding the men to the undertakings, and gave them a keener interest in their work and the prosperity of their industry.

Finland Imports More Sodium Sulphate

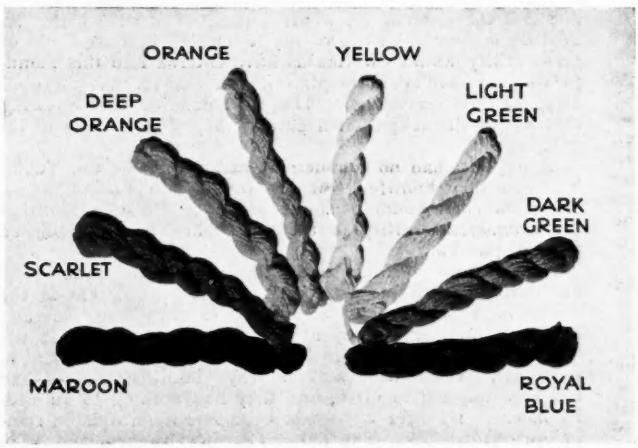
SODIUM sulphate is the second most important of Finland's chemical imports, its position being due to the predominance of the paper and pulp industry, and little if any local production. In 1932 imports into Finland of about 37,400 metric tons of sodium sulphate represented an increase of 8,000 tons over 1931. Data covering this import trade in the three preceding years are as follows, in metric tons: 1928—27,996; 1929—34,150; and 1930—40,975.

A New System of Artificial Daylight

Protection against Fire and Explosion

A NEW system of artificial daylight, which is contrived by the use of neon luminous tubing giving a very close approach to actual north sky daylight has been introduced by the General Electric Co., Ltd. This form of lighting is particularly suited to various industries where true colour perception during the manufacture of various articles is necessary.

The artificial reproduction of daylight has baffled illuminating engineers for many years. Most forms previously employed have suffered from incomplete attainment of daylight colour values, lack of constancy throughout life, and heavy cost of operation due to the inherent inefficiency of colour correcting devices. As a result many operations where a true perception of colour values is essential, have only been possible during daylight hours. The G.E.C. Claudegen daylight, by its close approximation to the best form of daylight, and its absolute constancy throughout life, makes it an even more reliable form of illumination than daylight itself. Natural daylight varies from day to day, according to cloud, mist or sunshine. Its composition is also influenced by the colour and nature of the surrounding objects in any particular



Reproduced from an untouched photograph of skeins of wool of various colours as revealed by Claudegen daylight.

locality, but this artificial daylight never varies and is the nearest approach to true natural daylight yet attained, as evidenced by the accompanying photograph. It is well diffused, remains constant, is a pleasant light for all working conditions, and causes no injurious effect to eyesight, while it promotes acuity of vision. It is claimed to be less costly to run than any other form of colour-corrected light, is inexpensive to maintain, and is entirely British-made.

As a protection against fire and explosion risks Claudegen daylight system is infallible, for it is incapable of setting fire to inflammable or explosive gases and materials, and is, therefore, particularly suitable for use in cellulose paint spraying shops and similar situations where inflammable materials are being handled. This system is supplied in the form of luminous tubing, which can be installed on ceilings or walls either with or without special reflectors; alternatively it can be supplied in the form of a portable unit. The latter, however, owing to possibility of plug-in or connection sparking, is not suitable for use in inflammable surroundings. Beyond regular cleaning of the tubing it needs no attention and continues to operate at its maximum efficiency, subject to the periodic replenishment of the gas separator.

Such artificial daylight, moreover, excells for all industrial processes where true colour perception is required. Apart from the many processes in the manufacture of coloured fabrics such as cotton goods, carpets, artificial silk goods and textiles, there are processes in many industries where the first indication of an error in manufacture is indicated by a slight change of colour in the product. The use of G.E.C. artificial daylight permits of the detection of blemishes in finish or texture during manufacture, and thus obviates the possibility of the error being perpetrated throughout all processes of manufacture. For these reasons it is especially suitable for a large number of trades and industries.

The current consumption varies appreciably according to the length of tube concerned. For a 100 ft. length it would

The Claudegen Portable Daylight Lighting Unit for studying colour combinations during manufacturing operations.

be approximately 36 watts per foot run, decreasing to 30 watts per foot run for a 130 ft. length, which is the maximum single-phase length that can be supplied. The minimum economic length is 60 ft., at which the current consumption will have increased to approximately 40 watts per foot run, and below this length the efficiency decreases rapidly. The absolute minimum length is 15 ft., at which the consumption rises to approximately 65 watts per foot run. Three-phase installations can be supplied for lengths from 45 ft., minimum up to 195 ft. maximum, the minimum economic length as above being 130 ft. Where a length of tubing justifies it, and it is required to balance the load, or to eliminate successive image, two or three single-phase tubes on separate phases will often give more satisfactory results than a three-phase installation. An intensity of 10 ft. candles should be expected from an installation allowing 1 ft. run of tubing for 3 to 4 sq. ft. of working area to be illuminated.

British Celanese, Ltd., v. Courtaulds, Ltd.

Further Arguments for Courtaulds

IN the Court of Appeal on Friday, the Master of the Rolls and Lords Justices Lawrence and Romer resumed the hearing of the appeal by the British Celanese from the dismissal by Mr. Justice Clauson, sitting in the Chancery Division, against Courtaulds, alleging infringement of two letters patent for evaporation or dry spinning of cellulose acetate rayon, which the judge had pronounced to be invalid.

Mr. Whitehead, K.C., continuing his arguments for Courtaulds, contended that the idea of downward spinning had been disclosed by Bersch's specification. There could be no valid patent for verifying the truth of a statement which had been made and there could be no inventive step in 1920 in the motion of downward spinning.

An experiment to illustrate filament formation was then conducted in Court. Cellulose acetate dissolved in acetone was extruded from a grease gun and their lordships were shown how the filaments hardened almost at once in the air.

The Master of the Rolls pointed out that the temperature of the Court was about 68° F.

Mr. Whitehead then proceeded to deal with common general knowledge as to the plaintiffs' process, and said that anyone in the industry reading Clark's specification in 1920 might be presumed to possess that knowledge. No one in that case had suggested that the substitution of warm air for heated steam as the evaporative medium would involve invention. The proper conclusion was that Clark's specification deprived the alleged invention of any patentable subject matter.

With regard to the Loewe specification his submission was that the specification had completely disclosed the formation of the thread by solidification in the air from the point of extrusion down to the bobbin. After that publication there could be no subject matter in the plaintiffs' alleged invention having regard to the common general knowledge in 1920. The only difference was the use of hot air for drying the filaments and the addition of the casing.

He submitted that the plaintiff's first patent was invalid and that the learned judge's judgment was absolutely correct.

The Cap Spinning Device

Coming to the second patent, Mr. Whitehead said it was for a cap spinning device and that there was no imitation in plaintiffs' specification to any particular derative of cellulose and no limitation to using the process merely with upward or with downward spinning. Further it was not limited to outside or inside winding or to the use of a stationery cap. The cap could be caused to rotate as well as the bobbin and there was no limitation to any particular speed of rotation. Plaintiffs said that it was true this was an old device, but the fact was that it had never been specifically suggested before for spinning dry rayon. It could not be suggested that there could be any inventive step in thinking of a cap spinning device, because no witness had stated that the cap would not have occurred to him. As to the plaintiffs' claim with regard to lubrication of the filaments, it was difficult to believe that lubrication could be made the basis of a monopoly claim. He submitted that there was evidence of the use of oiling in the textile industry and in knitting machines, where there was a considerable amount of friction. There was even evidence that it had been used many years in knitting machines in connection with the knitting of fabrics from rayon for the purpose of preventing the production of a hairy material. It was an obvious thing to do if there was seen to be roughness in the fibre by rubbing on the cap. Under all the circumstances he contended that the Court should dismiss the appeal.

Sir Stafford Cripps, K.C., followed Mr. Whitehead and said that the suggestion that this patent started the plaintiffs' off on the successful manufacture of cellulose acetate silk was completely and absolutely negatived by their own documents.

Sir Arthur Colefax, K.C., replying on the whole case, said the real question the Court had to decide was that of patentable subject matter. The way to approach that question was to realise that this was a process which was the subject of the first patent. It must be regarded in its totality and the question was, aye or no, was that process, so regarded, novel. If it was, the second question was—was it useful. And then came the third question: did it at the date of the patent constitute good subject matter for a valid grant of a patent. The arguments put forward by counsel for the respondents had frequently been based upon an evasion of that true legal approach to the question. This was a case in which, to a larger degree than in any other case he recollected the question of common knowledge had required consideration. A distinction had always been maintained between common knowledge and public knowledge, but he was quite content to take the definition of the respondents. But that common knowledge must be proved. It would not do for respondents to say they had obtained admissions from a witness behind which plaintiffs' could not go. Counsel was not aware that a witness could make admissions. He was there to give evidence to the Court. Respondents had tried to supplement what was contained in the prior documents by what was put forward as common knowledge. That was the fallacy and weakness of their case.

Commercial Utility

Apart from these considerations the Court had to be satisfied that the common knowledge appeared to exist here. As to the commercial utility of the invention, if it were not of great utility would Courtaulds have entered into this manufacture and have taken the plaintiffs' process for that purpose? That was not questioned. They had done so, and knowing that it was the subject of a patent, they took the risk of infringing it.

Again, if it had no commercial value, why did the Tubize Co., with their knowledge of dry spinning, take out a licence to use the corresponding patents abroad? He submitted that the commercial utility of the patent had been established beyond question.

With respect to the non-application of the process to nitro silk, Courtaulds had certainly not proved that in the conditions of the process as applied to nitro there was any danger beyond what they all knew was experienced in the nitro silk process, although it had been much exaggerated in that case. There were reasons why plaintiffs' process had not been applied to nitro, and they had nothing to do with its merits. By 1912 viscose had become a formidable competitor of nitro silk. The Tubize Co., in substance, controlled the manufacture of nitro on the continent and they had formed a company in America. What was important was that as soon as acetate silk was produced it was realised that it had advantages over nitro, the one outstanding advantage being that the spun products did not require any further treatment. The matter was proved by the fact that to-day nitro, too all intents and purposes, was finished. There was only one factory left and that was in Vienna. Acetate silk was not only holding its own against viscose, but Courtaulds, the pioneers of the viscose industry, had been compelled to embark on its manufacture. Its merits were outstanding. As to the contention that the process had not been applied to other derivatives of cellulose for which its utility was claimed, there had been no need to do so.

Judgment Reserved

On Tuesday Sir Arthur, continuing, said there had been no previous disclosure of any dry spinning evaporative process of rayon manufacture and that the multi-hole jet had not been used in any dry process prior to the Celanese invention. In Chard's specification there was no disclosure of any dry spinning or evaporative process, and as Lebner did not extrude the filaments downwards, his specification would not be fitted into the words of Celanese claim. Loewe in his specification made a special point of the fact that he was not spinning in a case but in free air. The documents did not disclose that anyone in 1920 would have thought that in the direction of downward spinning there was any possibility in the art of making artificial silk by dry spinning or evaporative process.

The Court reserved its judgment.

Moulded Insulating Materials

New British Standard Specification

WHAT is perhaps the most important link in the series of British Standard Specifications for electrical insulating materials is that just published as B.S.S. No. 488-1933, for moulded insulating materials for accessories for general electrical installations. The appearance of this specification at the present time is appropriate, for there is a tendency to break away from the belief that electrical accessories should be constructed, wherever possible, of earthed metal, and to substitute for it the concept of all-insulated exteriors. It might reasonably be said that the plastics industry is the offspring of the electrical industry, for the technique now displayed by the former was unquestionably built up in meeting the demands of the latter. It is a significant fact that most of the scientific testing equipment installed by moulders has been introduced since this specification was put in hand, a few years ago, and that it follows closely the technique therein described.

The materials covered by the specification are classified on the basis of deformation temperature, this being the method recommended by the Electrical Research Association, and having, in the opinion of the drafting committee, the smallest number of objectionable features. Four grades of materials are covered, these corresponding to good quality synthetic resin (deforming temperature above 140° C.), medium quality synthetic resin (100° C.), loaded hard-rubber (70° C.), and non-loaded hard-rubber (55° C.), respectively. The mechanical and electrical properties are defined by means of limits, determined after thorough investigation by the Electrical Research Association, and other independent authorities. Ample appendices deal with the details of the tests for these properties and for the conditioning of the specimens before test.

There are a number of significant omissions from the specification, but there appear to be good reasons for these, and while it will be possible for certain of the more advanced specialists in electrical mouldings to claim that their technique is in advance of that imposed by the specification, the fact remains that the general adoption of the standard aimed at will rule out many of the inferior components that have a tendency to maintain prices at an uneconomic level. Copies of this specification may be obtained from the Publications Department, British Standards Institution, 28 Victoria Street, S.W.1, price 2s. 2d. post free.

British Industries Fair

Extensions at Birmingham

TO meet increased demands by exhibitors, important extensions and re-arrangements of the British Industries Fair grounds and buildings at Castle Bromwich have been authorised by the council of the Birmingham Chamber of Commerce, which is responsible for organising the Birmingham section of the Fair. The Fair Management Committee has also decided to make an admission charge of 2s. for trade buyers attending the Birmingham section in 1934. Hitherto buyers have been admitted to the Birmingham section without charge, although, for the first time in the history of the Fair, buyers were charged 2s. for admission to the London sections this year. Provisional bookings of space by exhibitors for the Birmingham section of the 1934 Fair are 37 per cent. greater than corresponding bookings last year for the 1933 Fair. Of a total available indoor space of 244,362 sq. ft., 177,907 sq. ft. have been provisionally booked already for 1934, in comparison with 129,926 sq. ft. provisionally booked at a corresponding date last year.

Plans have been approved having as an ultimate objective a permanent exhibition building with a total indoor area of 1,000,000 sq. ft., of which 500,000 sq. ft. will be available for exhibits. A 99 years' lease of the site has been negotiated. Extensions are to be put in hand immediately to add 55,000 sq. ft. of indoor area, of which 30,000 sq. ft. will be let to exhibitors, in time for the 1934 Fair. The additional space to be provided for the 1934 Fair will be set aside for the gas, electricity, building and engineering groups in which congestion has become especially marked.

Chemists in Glasgow

Summer Meeting of the Scottish Sections

THE joint summer meeting of the Scottish sections of the Institute of Chemistry, the Society of Chemical Industry and the Chemical Society began in Glasgow on Friday, May 26 when members were received in the Glasgow University Students' Union by Professor F. J. Wilson, the chairman of the Glasgow section of the Society of Chemical Industry. After the reception a short paper on "Cellulose and Some of Its Uses" was read by Dr. W. J. Jenkins, of the technical department, Nobel Section, Imperial Chemical Industries, Ltd., Ardeer.

Dr. Jenkins said that the property which, more than any other, had rendered cellulose satisfactory in connection with textile, paper, artificial silk,etc., was its tensile strength. The tensile strength of good quality cellulose was of the same order as that of the heavy metals and measurements showed that good quality steel had a higher tensile strength but copper, iron and aluminium had lower strengths than ramie cellulose. From the evidence at present available it seemed that cellulose was built up of chains of molecular units of glucopyranose molecules linked together. The factors which contributed most to its remarkable tensile strength were the chain lengths, the interlocking of these chains and the cohesional forces which held them together.

After dealing at some length with the chemical aspect of solvents for nitro-cellulose, Dr. Jenkins mentioned the use of cellulose derivatives in the production of artificial leathercloth. The process, he said, consisted essentially in applying a suitably coloured plastic mass of cellulose derivative to a woven (generally cotton) fabric and thereafter impressing the required grain in relief upon the product by means of embossing plates or rolls. Nitro-cellulose was the chief derivative used at present in the manufacture of artificial leathercloth although a limited amount was prepared from some of the other cellulose derivatives. The quality of the finished material depended to a considerable extent on the base cloth which was used. A big range of greycloths were in use and special treatment was sometimes given to the back of these cloths in order to give novel effects. Glossy, dull or semi-dull finishes could be obtained and sometimes special cloths with antique effects were made.

Following Dr. Jenkins' address an informal dinner was held in the College Club at Glasgow University, when Professor F. J. Wilson occupied the chair. On Saturday visits were arranged to Auchencruive in the morning and to Ardeer in the afternoon. Auchencruive, which is situated near Ayr, is the centre for the practical work done in connection with the West of Scotland Agricultural College. At the Ardeer Factory of Imperial Chemical Industries the party were met by Mr. Donaldson, the works manager, and conducted round the plant in small groups. The various stages in the nitration of glycerine and cotton were described and the manufacture of sulphuric and nitric acids by modern methods proved of great interest.

Alliance Artificial Silk, Ltd.

A Loss of £963,066

IN the Chancery Division, on Monday, Mr. Justice Bennett had before him a petition by Alliance Artificial Silk, Ltd., for the confirmation of the reduction of its capital from £1,550,000 to £240,766, 10s.

Mr. Buckmaster said the total loss to be written off was £963,066 as they got rid of 900,000 unissued 5s. shares and 400,000 forfeited shares. The shares were originally 5s. shares, but it was now proposed to issue £1 shares. The loss of £963,066 was accounted for as follows:—Loss on land and buildings £241,000, loss on plant £165,000, further loss on undelivered plant or plant not used £55,000, and loss on patents £51,000, plus the unissued and forfeited shares. The preliminary expenses were £114,000 and development expenses £181,000. Part of the loss was due to the changed conditions in the manufacture of artificial silk. Counsel said the object of writing the capital down was to get fresh capital if possible and get the company going again.

His lordship observed that there had been a loss of £900,000 in four years. He sanctioned the reduction as asked for.

News from the Allied Industries

Non-Ferrous Metals

A NEW ALUMINIUM ALLOY produced by the I.G. Farbenindustrie is claimed as marking a distinct advance, and as being especially suitable for aeroplanes and seaplanes. It is named "hydronalium," and is not liable to corrosion.

Artificial Silk

THERE WAS A MARKED DECLINE in British rayon production in April, which month included a large scale closing down of spinning machinery at Easter. The total of yarn and waste in April was 5,160,000 lb., compared with 6,640,000 lb. in March and 6,450,000 lb. in April last year. So far this year British rayon production is falling well below last year's level, and the total for the first four months of the year was 23,160,000 lb., compared with 24,880,000 lb. in the corresponding period of 1932.

Dyeing and Cleaning

AT THE FORTHCOMING ANNUAL MEETING of the Associated Dyers and Cleaners, Ltd., an attempt will be made by a group of shareholders to secure the election to the board of directors of Mr. Frank Eastman and Major William Gillespie. In a circular letter issued by the former, who, it will be recalled, retired from the chairmanship two and a half years ago, it is stated that in allowing their names to go forward both Major Gillespie and Mr. Eastman do so because they believe that their practical experience and organising ability will be of great value at the present time in assisting to restore the business to its old position. As a trustee Major Gillespie represents a large shareholding, and was associated with the business for many years. Mr. Eastman's personal stake in the successful company also is considerable, his holding representing more than one-tenth of the capital. The accounts of the company for the past year, which have been delayed owing to the investigation made into the affairs of one of the company subsidiaries, J. Pullar and Son, Ltd., disclose that operations have yielded very disappointing results. A net loss of £48,869 has been incurred, compared with a profit of £36,320 reported for the previous year. After deducting the balance of £24,385 brought in, there remains a debit of £24,484, which is to be wiped out by means of a transfer from the general reserve. As the cumulative dividend on the preference-shares is in arrear from April 30, 1932, holders now have the right to attend and vote at the annual meeting.

Whale Oil

THE HOUSE OF LORDS on May 18 unanimously allowed the appeal of the two Norwegian oil companies known as the Polaris and the Globus, of Oslo, against Unilever, Ltd., Lever Bros., Ltd., and De Nordiske Fabriker De-No-Fa, of Oslo. The Polaris and Globus companies originally claimed damages amounting to £447,160 on one footing, or, alternatively, £276,500. Mr. Justice Branson decided against them, and the Court of Appeal upheld his decision. The point raised was whether the respondents had agreed to take the whole of the whale oil production for the season 1930-31 of two vessels, known technically as "floating factories," belonging to the two Norwegian whaling companies, or whether they agreed to take only the quantity which the two vessels could produce and carry home in their own tanks. After the vessels had discharged part of their production into tankers, the respondents refused to take delivery, contending that they had not agreed to accept oil transhipped into tankers, but only the oil that the "floating factories" could themselves carry. Giving judgment, Lord Atkin said the respondent companies had been in the habit of acquiring each year about 80 per cent. of the world production of whale oil. The market price in the year in question fell to £14 below the contract price. The claims of the Polaris Co. amounted to more than £260,000, and of the Globus to more than £180,000. He was of opinion that the meaning of the contract was that the buyers had bought the whole of the whale oil produced by the factory ships, and that the sellers were entitled to deliver such oil not only from the factory ships themselves, but from the vessels to which they might have transferred oil. He differed reluctantly from the judges in the Courts below, and was of opinion that the appeal should be allowed. Damages would have to be assessed if the parties failed to agree on a sum.

Dye Manufacture

IMPROVEMENT IN THE POSITION announced a year ago by the Yorkshire Dyeware and Chemical Co., Ltd., has been well maintained in the year ended March 31 last. The accounts for that period show a profit, after providing £2,781 for depreciation and £1,500 for directors' fees, of £23,756, which compares with £22,410 a year ago (after allowing £3,256 for depreciation and £1,500 directors' fees). For 1930-31 the profit was £17,009. A year ago the final dividend was 7½ per cent., making 10 per cent. for the year, and a bonus of 9d. per share. There was also distributed one new 5s. share for every 15s. share held, thus increasing the share capital from £150,000 in 200,000 15s. shares to £200,000 in 200,000 shares of £1 each. Upon this larger capital the final dividend now announced is 7½ per cent., again bringing the dividend up to 10 per cent. for the year, but the cash bonus is not repeated.

Chemical and Metallurgical Corporation

Important Deal Foreshadowed

AN important deal affecting the future of the Chemical and Metallurgical Corporation is foreshadowed in a circular letter to shareholders. It is disclosed that the directors are in negotiation with a substantial concern, as a result of which an offer may be made to acquire the whole of the issued capital of the corporation. In those circumstances shareholders are advised in their own interests not to part from their holdings pending receipt of a further statement from the Board. Another communication will be made at the earliest practicable date. This development will probably be welcomed by shareholders, as the operating results of the corporation since its formation in 1919 have been very disappointing. No distribution has ever been made on either class of capital, while arrears of dividend on the 8 per cent. preference shares to the beginning of 1932 were cancelled under the scheme of reorganisation approved last year. The nominal value of those shares was then reduced from £1 to 10s. each and 1s. 8d. was written off each 2s. ordinary share. Both classes were subsequently consolidated into shares of their former face value. The company was originally formed to acquire rights in respect of inventions for the treatment of complex zinc, lead and silver ores, but these processes have been abandoned.

Lawn Tennis Tournament

Some More First Round Results

ALL first round matches in the third annual Chemical Industry Lawn Tennis Tournament must be played by Monday, June 12, and the results, signed by all players (winners and losers) must be forwarded to reach the Editor of THE CHEMICAL AGE not later than 9.30 a.m. on Tuesday, June 13. Results of two matches in the singles and two in the doubles were reported last week, including the defeat of S. E. Chaloner and W. Speakman ((Monsanto Chemical Works, Ltd., Ruabon), last year's winners of THE CHEMICAL AGE silver challenge cup, in the doubles, and the defeat of Speakman in the singles. On May 26 S. E. Chaloner was also beaten in his first match in the singles, his opponent being P. A. Tunstall (Salt Union, Ltd., Liverpool). Results of matches played during the past week are as follows:—

SINGLES.

P. A. Tunstall (Salt Union, Ltd., Liverpool) beat S. E. Chaloner (Monsanto Chemical Works, Ltd., Ruabon) 6—4, 6—3.

D. Blow (British Drug Houses, Ltd.) beat D. B. Hodgson (George Scott and Son, London, Ltd) 6—2, 6—3.

A. Collins (British Oxygen Co., Ltd.) beat R. A. Nottingham (Le Grand Sutcliff and Gell, Ltd.) 6—3, 6—1.

L. Giltrow (Williams, Hounslow, Ltd.) beat R. Frost (British Oxygen Co., Ltd.) 6—3, 6—2.

DOUBLES.

L. F. Grape and A. F. Childs (Borax Consolidated, Ltd.) beat A. A. Killick and G. A. Brittain (B. Laporte, Ltd., Luton) 6—4, 6—3.

Inventions in the Chemical Industry

Specifications Accepted and Applications for Patents

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Accepted with Dates of Application

METHOD OF, AND MEANS FOR, OBTAINING RUBBER IN GRANULAR FORM FROM DISPERSIONS SUCH AS LATEX, OR FROM SOLUTIONS.—A. J. A. Y. De Schepper. Aug. 21, 1931. 392,592.

MANUFACTURE OF COMPOUNDS FROM TERPENE ALCOHOLS AND HYDRO-AROMATIC ALCOHOLS.—Howards and Sons, Ltd., J. W. Blagden, and W. E. Huggett. Oct. 15, 1931. 392,571.

PRODUCTION OF DISTRIBUTABLE AND NON-CAKING FERTILISERS CONTAINING CALCIUM NITRATE.—Lonza Elektrizitatswerke Und Chemische Fabriken Akt.-Ges. E. Luscher and E. Stirnemann. Nov. 1, 1930. 392,531.

METHOD OF FORMING NICKEL OXIDE CAPABLE OF REDUCTION AT A LOW TEMPERATURE.—Rose, Downs and Thompson, Ltd., and T. Andrews. Oct. 21, 1931. 392,600.

FUNGICIDES.—Electro Chemical Processes, Ltd., and E. Hatschek. Nov. 17, 1931. 392,556.

DESTRUCTIVE HYDROGENATION OF CARBONACEOUS MATERIALS.—H. B. Somerset, R. Holroyd, and Imperial Chemical Industries, Ltd. Nov. 17, 1931. 392,559.

MANUFACTURE OF SULPHONATION PRODUCTS FROM HIGHER HYDROXY-FATTY ACIDS, OR ESTERS, OR OTHER DERIVATIVES THEREOF. A. G. Bloxam (Soc. of Chemical Industry in Basle). Nov. 18, 1931. 392,568.

MANUFACTURE OF SODA-LIME.—Dewey and Almy, Ltd. Dec. 22, 1930. 392,613.

PROCESSES AND APPARATUS FOR THE PRODUCTION OF BITUMINOUS MIXTURES.—R. Edgeworth-Johnstone. Nov. 25, 1931. 392,620.

APPARATUS FOR CAUSING LIQUIDS TO REACT WITH GASES OR VAPOURS.—J. Y. Johnson (I. G. Farbenindustrie). Nov. 30, 1931. 392,631.

MANUFACTURE AND PRODUCTION OF WETTING AGENTS FOR MERCERISING LIQUORS.—J. Y. Johnson (I. G. Farbenindustrie3. Dec. 3, 1931. 392,636.

PREPARATION OF METALLIC SULPHIDES ALONG WITH METALS OR MASSIVE SILICON.—E. Wydler. Dec. 16, 1931. 392,640.

PROCESS OF, AND APPARATUS FOR, THE THERMAL DECOMPOSITION OF HYDROCARBONS.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. July 14, 1931. 392,643-4.

PROCESS FOR THE MANUFACTURE OF KETONES.—Naamlooze Vennootschap de Bataafsche Petroleum Mootschappij. Jan. 17, 1931. 392,652.

MANUFACTURE OF ETHYL ALCOHOL.—Distillers Co., Ltd., W. P. Joshua, H. M. Stanley, and J. B. Dymock. Feb. 19, 1932. 392,685.

APPARATUS FOR CARRYING OUT EXOTHERMIC HYDROGENATION REACTIONS UNDER PRESSURE.—J. Y. Johnson (I. G. Farbenindustrie). Feb. 22, 1932. 392,688.

PROTECTION AGAINST CORROSION OF ALUMINIUM AND ITS ALLOYS AND MAGNESIUM AND ITS ALLOYS.—Soc. Continentale Parker. April 27, 1931. 392,728.

PRODUCTION OF SOAP-LIKE PREPARATIONS, WETTING, DISPERSING AND PENETRATING AGENTS, AND PROTECTIVE COLLOIDS.—Dr. H. Hunsdiecker and Dr. E. Vogt. June 30, 1931. 392,763.

MANUFACTURE OF ALKALI CARBONATE OR ALKALI HYDROXIDE.—A. Mentzel. July 15, 1931. 392,765.

MANUFACTURE OF MIXED ESTERS OF CELLULOSE.—Kodak, Ltd. July 28, 1931. 392,775.

CALCINATION OF GYPSUM.—E. L. Francis (Gypsum Lime and Alabastine, Canada, Ltd.). Aug. 13, 1932. 392,780.

CRYSTALLISATION PROCESSES.—W. J. Tennant (Aktieselskapet Krystal). Oct. 28, 1932. 392,829.

DISTILLATION OF AMMONIACAL LIQUOR.—W. C. Holmes and Co., Ltd., C. Cooper and D. M. Henshaw. Nov. 17, 1931. 392,560.

Applications for Patents

INSULATION OF RECEPTACLES ADAPTED TO CONTAIN SOLID CARBON DIOXIDE.—S. D. Ware. May 12. 13877.

APPARATUS FOR PRODUCTION OF PROTECTIVE GASES FOR HEAT-TREATMENT OF METALS.—Birmingham Electric Furnaces, Ltd., and A. G. Lobley. May 19. 14504.

PURIFYING AIR OR GASES.—H. A. Brassert and Co., Ltd. May 20. 14669.

TREATMENT OF TEXTILE, ETC., MATERIALS.—British Celanese, Ltd. May 17. (United States, May 17, '32.) 14314.

RESINOUS COMPOSITIONS.—British Thomson-Houston, Ct., Ltd. May 17. (United States, May 25, '32.) 14298.

RESINOUS COMPOSITIONS.—British Resin Products, Ltd., and H. E. Mabey. May 17. (United States, May 25, '32.) 14298.

APPLICATION OF DYESTUFFS.—N. Chappell, H. N. Haddock, Imperial Chemical Industries, Ltd., and F. Lodge. May 18. 14437.

MANUFACTURE OF A DECHLORINATED CONCENTRATED DIETETIC FOOD PREPARATION.—Chemopharm, Ltd., and F. W. R. Osten. May 18. 14418.

MANUFACTURE OF WATER SOLUBLE DERIVATIVES OF MENTHOL AND THYMOL.—Chemopharm, Ltd. May 18. 14419.

PROCESS FOR IMPROVING PROPERTIES OF HYDRAULIC CEMENTS.—J. M. Curschellas. May 19. (Germany, May 23, '32.) 14592.

METHOD OF STABILISING CHLORINATED ALIPHATIC HYDROCARBONS. Dow Chemical Co. May 19. (United States, June 22, '32.) 14556.

APPARATUS FOR MOULDING PLASTIC MATERIAL.—Dunlop Rubber Co., Ltd. May 18. 14387.

PRODUCTION OF CONCENTRATED INDIARUBBER.—Dunlop Rubber Co., Ltd. D. F. Twiss and E. W. B. Owen. May 20. 14654.

MANUFACTURE OF AZO DYESTUFFS.—E. I. Du Pont de Nemours and Co. May 17. (United States, May 17, '32.) 14333.

MANUFACTURE OF ACETIC ACID, ETC.—E. I. Du Pont de Nemours and Co. and J. W. Lawrie. May 17. 14335.

MANUFACTURE OF RUBBER PRODUCTS.—M. Dupret. May 16. 14160.

MANUFACTURE OF BASES DERIVED FROM BENZ-DIOXANE.—L. S. E. Ellis (Soc. des Usines Chimiques Rhône-Poulenc). May 19. 14574.

DYESTUFFS, ETC.—R. W. Everatt and Imperial Chemical Industries, Ltd. May 17. 14334.

MANUFACTURE OF ANTI-CRYPTOGAMIC POWDER HAVING A COPPER OXYCHLORIDE BASE.—L. Ferri. May 19. 14566.

MANUFACTURE OF SOLUTIONS OF THERAPEUTICALLY-VALUABLE COMPOUNDS.—I. G. Farbenindustrie. May 15. (Germany, May 14, '32.) 14062.

PRODUCTION OF EXPLOSIVES.—I. G. Farbenindustrie. May 15. (Germany, Aug. 10, '32.) 14084.

MANUFACTURE OF NEUTRAL WATER SOLUBLE ORGANO-METALLIC COMPOUNDS.—I. G. Farbenindustrie. May 15. (Germany, May 14, '32.) 14099.

MANUFACTURE OFF CONVERSION PRODUCTS OF CASEIN.—I. G. Farbenindustrie. May 16. (Germany, May 17, '32.) 14207.

MANUFACTURE OF NEUTRAL WATER SOLUBLE COMPLEX COMPOUNDS OF TRIVALENT ANTIMONY.—I. G. Farbenindustrie. May 18. (Germany, May 19, '32.) 14438.

MANUFACTURE OF SOLID STABLE DIAZO-AZO-SALTS.—I. G. Farbenindustrie. May 19. (Germany, May 19, '32.) 14553, 14554.

PURIFICATION OF PARAFFIN WAX.—J. Y. Johnson (I. G. Farbenindustrie). May 19. 14548.

MANUFACTURE OF OIL VARNISHES.—J. Y. Johnson (I. G. Farbenindustrie). May 19. 14549.

MANUFACTURE OF VALUABLE ORGANIC COMPOUNDS.—J. Y. Johnson (I. G. Farbenindustrie). May 20. 14648.

PRODUCTION OF DYES OF THE CYANINE TYPE.—J. D. Kendall. May 18. 14471.

DYESTUFFS, ETC.—A. H. Knight. May 17. 14334.

MANUFACTURE OF RUBBER THREADS.—R. F. McKay (International Latex Processes, Ltd.). May 20. 14632.

METHOD OF CASTING MAGNESIUM, ETC.—E. H. Moore. May 15. 14014.

SYNTHETIC RESIN MOULDINGS.—J. B. Morgan. May 19. 14511.

FERTILISERS.—C. Pickstone. May 18. 14431.

TREATMENT OF RUBBER LATEX, ETC.—F. G. Smith and W. Young. May 18. 14427.

MANUFACTURE OF AMMONIUM TRINITRATE.—Stockholms Superfosfat Fabriks Aktiebolag. May 18. (Sweden, May 21, '32.) 14461.

MANUFACTURE OF AZO DYESTUFFS.—Soc. of Chemical Industry in Basle. May 15. (Switzerland, May 15, '32.) 14061.

MANUFACTURE OF FERTILISERS.—Stockholms Superfosfat Fabriks Aktiebolag. May 18. (Sweden, May 21, '32.) 14462, 14463.

PURIFICATION OF SUGAR FACTORY AND REFINERY JUICES.—D. Teatini. May 19. 14593.

PURIFICATION OF PHENOLS.—W. W. Triggs (E. I. Du Pont de Nemours and Co.). May 18. 14399.

PROCESS FOR MAKING SULPHONIC ACIDS.—W. W. Triggs (Flesch-Werke Akt.-Ges. für Gerbstofffabrikation u. Chem. Produkte). May 15. 14042.

SINTERED MAGNESIA, ETC.—Alterra. May 23. (April 23, '32.) (Austria, April 25, '31.) 14884.

COMPOSITION AND PREPARATION OF SOLDERING MATERIALS.—H. Bauerle, and British Machine Chain, Ltd. May 25. 15111.

TREATMENT OF HYDROCARBON MATERIAL.—J. S. Belford, S. Billbrough and Yorkshire Tar Distillers, Ltd. May 22. 14781.

FLOTATION OF ORES.—H. T. Böhme. May 22. (Germany, July 7, '32.) 14793.

PRODUCTION OF ALKALINE PHOSPHATES.—Bozel-Malétra Soc. Industrielle de Produits Chimiques. May 26. (France, May 26, '32.) 15307.

From Week to Week

LORD MELCHETT has consented to accept the presidency of the British Science Guild in succession to Sir Samuel Hoare, whose three-year term of office ends in June, 1933.

THE STAFFS OF THE SCOTTISH FACTORIES of Imperial Chemical Industries played their annual golf competition for the Johnston Cup over the Old Troon course. W. M'Kenzie (13) won the trophy with a score of 72.

THE PROVINCIAL GOVERNMENT OF KIANGSI has decided to erect a paper mill at Yiungshin at a cost of about 400,000 dollars. The mill is to be completely equipped with the most modern plant, and will make only the special paper most in demand on the Chinese market.

OVER SIXTY MEMBERS of the Cardiff Naturalists' Society last week visited the by-product works of the Powell Duffryn Co., Ltd., at Bargoed, Rhymney Valley. They were received by Mr. J. West, manager, who explained the operations carried out at the works. The party was afterwards entertained to luncheon.

RECENT WILLS include:—Mr. J. S. Ellison, of Gomersal (Yorkshire), manufacturing chemist, £31,229 (net personalty £27,892). Major Wellwood Maxwell, J.P., D.L., of Dalbeattie, a director of the Merton Rubber Syndicate, Ltd., £28,793; Mr. Richard Slater, of 42 Somerset Road, Bolton, retired bleacher, £25,189 (net personalty £23,956).

IN THE CHANCERY DIVISION on Monday, Mr. Justice Bennett had before him a petition by Tar Distillers, Ltd., for the confirmation by the Court of the reduction of its capital. Counsel stated that the company sought to reduce its capital from £100,000 to £80,000, that amount of capital being in excess of the company's requirements. The £20,000 would be returned to the shareholders. His lordship confirmed the reduction as asked.

IN THE COMPANIES COURT on Monday, Mr. Justice Bennett had before him a petition for the compulsory winding up of Electrochemical Installations, Ltd. Counsel said the matter had stood over to enable certain terms to be carried out between the company and the petitioning creditor. The terms had been carried out and his client had been paid a substantial part of his debt by a third party and there was a guarantee for the balance. He therefore asked that the petition should be dismissed, the costs to be taxed and paid by the company. His lordship ordered accordingly.

IN THE FOURTEEN YEARS since its inauguration the membership of the Institute of Physics has increased steadily and at the end of 1932 was 695. The report for the year 1932 shows that the many activities of the Institute have continued to prosper and that the "Journal of Scientific Instruments" has made satisfactory progress. The opening in May of the joint library and reading rooms by the president, Lord Rutherford, marked an important step in the progress of the Institute and forms an example of what can be achieved by the co-operation of participating societies. Its establishment is the result of the work of the joint library committee originally set up by the Institute, the Physical Society of London and the Optical Society.

MR. A. M. WISEMAN, M.C., British Trade Commissioner in Toronto, is now on leave in this country and will be available at the Department of Overseas Trade, 35 Old Queen Street, London, S.W.1, to interview United Kingdom trade associations and business firms, who should make any applications for interviews with him. Mr. Wiseman will be prepared to discuss with trade associations, or with United Kingdom firms, who are contemplating an application for a review of duties by the Tariff Board under the United Kingdom-Canadian trade agreement made at Ottawa, the procedure with which, in the light of present information, it would be desirable for them to conform. Applications for interview should indicate the subject to be discussed (quoting Ref. C.Y. 4141).

THE ANNUAL CONFERENCE of the Textile Institute will be held at Harrogate next week, commencing on June 7 and finishing with a visit to the laboratories of the Wool Industries Research Association at Torridon, Leeds, on June 10. The conference proceedings will open with a civic reception at the Winter Gardens on the Wednesday evening, when the visitors will be received by the Mayor and Mayoress, Alderman J. Arthur Whiteoak, J.P., and Mrs. Whiteoak. The conference proper will begin on the Thursday morning at the Grand Hotel. In the afternoon there will be an excursion to York by special train, and members will visit the Minster, the works of Rowntree and Co., Ltd., and the L.N.E.R. Co.'s railway museum. In the evening there will be an Institute dinner, with the presentation of the Institute Medal to Mr. F. W. Barwick, chairman of the Selection Committee. The annual Mather Lecture will be contributed by Dr. T. Oliver, of Galashiels. The conference will be resumed on the Friday. The newly-elected president, Sir William Clare Lees, will be unable to attend owing to a long-standing previous engagement, but Mr. George Garnett, J.P., immediate past president, will attend.

DAMAGE TO THE EXTENT OF £10,000 was caused by an outbreak of fire on Sunday at the bleaching and dyeing works of J. and H. McConnell, Broadlie, Neilston.

PRICE DISEQUILIBRIUM and international indebtedness were dealt with by Dr. W. H. Coates, a director of Imperial Chemical Industries, Ltd., in a speech to the Plenary Session of the International Chamber of Commerce Congress in Vienna, on May 30.

A PLEA FOR INCREASED INVESTIGATION into the use of plastic materials in dentistry was made by Professor C. S. Gibson, F.R.S., of Guys Hospital in a lecture in connection with the Plastics Industrial Exhibition at the Science Museum on May 26.

HULL UNIVERSITY COLLEGE have decided to offer a post for a limited period to a dispossessed university teacher from Germany. A special position will be created, and the salary will be met from a fund which is being organised by the Jewish community.

A SYLLABUS OF SUMMER EVENING CLASSES has been issued by the Manchester Municipal College of Technology. This syllabus is issued in the form of a prospectus describing courses of lectures and laboratory work in many branches of technology including applied chemistry and textile chemistry.

THE NOMINAL CAPITAL of National Titanium Pigments, Ltd., of Adelaide House, King William Street, E.C., has been increased by the addition of £40,000 beyond the registered capital of £1,000. The additional capital is divided into 40,000 7½ per cent. cumulative preference shares of £1 each.

THE DEATH OCCURRED last week of Mr. William Watson, head of the firm of William Watson (Dundee), Ltd., Forebank Dyeworks, Dundee. Aged 72, he started with J. and F. Stevenson, who at that time owned the works, as an office boy, and rose to cashier and manager, eventually taking over the business in 1895. He was a former magistrate of the city.

SPEAKING AT THE ANNUAL MEETING of the London section of the British Association of Chemists on May 19, Mr. C. B. Woodley, general secretary of the Association, gave a more favourable account of the situation regarding employment than our short report last week indicated. Actually, there was a decrease of about 50 per cent. in the proportion of members seeking assistance during the year. The appointments bureau was the means of placing some 1,460 vacancies before the members, representing an increase of more than 50 per cent. over the previous year.

AN ACADEMIC ASSISTANCE COUNCIL has been formed, which will seek to raise a fund, to be used primarily, though not exclusively, in providing maintenance for displaced teachers and investigators of German universities and finding them the chance of work in universities and scientific institutions. The Royal Society has placed office accommodation at the disposal of the Council. Sir William Beveridge and Professor C. S. Gibson, F.R.S., are acting as hon. secretaries of the Council, and communications should be sent to them at the Royal Society, Burlington House, W.1.

SIR WILLIAM CLARE LEES was elected president in succession to Mr. G. Garnett at the 23rd annual meeting of the Textile Institute, held at Manchester last week. In acknowledging his election, he said from a review of the present situation they could take hope that when world conditions were re-created and when the volume of the external trade of the world had increased to a material extent they would be in a more competitive position than they had been for some time, and would be able to enter into a full share in the increased and upward tendency of world trade. This was a difficult time, when everybody was suffering in one direction or another, and it was well to look at basic facts and take comfort from them.

THE GOVERNORS OF THE ROYAL TECHNICAL COLLEGE, Glasgow, have unanimously appointed Mr. William Murdoch Cumming, D.Sc., F.I.C., to the "Young" Professorship of Technical Chemistry rendered vacant by the death of Professor Thomas Gray, D.Sc. The chair was founded and endowed in 1870 by the late Dr. James Young, F.R.S., of Kelly and Durris, and is the only Chair of Technical Chemistry in Scotland. Dr. Cumming graduated at Glasgow and Leeds. In 1916 he joined the staff of British Dyestuffs Corporation, being placed at first in the explosives department under the Ministry of Munitions. In the research department to which he was afterwards transferred, he developed processes for the manufacture of certain dyestuffs intermediates not previously manufactured in this country. In 1920 Dr. Cumming was appointed Senior Lecturer on Organic Chemistry in the Royal Technical College, and during his tenure of the post has been continuously engaged in research, chiefly bearing on the dyestuffs industry. He has made about 30 original contributions to the leading chemical journals. He is also joint-author of two important text-books on practical organic chemistry.

A FRENCH COMBINE is at present seeking permission from the Irish Free State Ministry of Industry and Commerce, to work deposits of fireclay and alabaster located at Arigna, County Leitrim.

THE FOOD GROUP of the Society of Chemical Industry has accepted the invitation of the Royal Sanitary Institute to organise the business of section "F," Hygiene of Food, on the occasion of its forty-fourth congress at Blackpool. Dr. L. H. Lampitt, chairman of the Group, will open a joint discussion to be held on Wednesday, June 21, on "The Wrapping of Bread and of Butter." The following will be the chief speakers: Dr. C. J. Fox, of Cross and Bevan; Mr. C. H. F. Fuller, of the research department of J. Lyons and Co., Ltd.; Mr. P. Arup, of the Department of Agriculture, Dublin, and Dr. G. H. Dart, Medical Officer of Health, Hackney.

MR. W. T. EDMUNDS, head of the chemistry department of the British Mannesmann Tube Co., Ltd., at Landore, near Swansea, has died. Mr. Edmunds was one of the best-known industrial chemists in South West Wales.

THE PRICE OF KELP for the distillation of iodine will fall considerably in respect of supplies from the Irish Free State this year, according to reports from Dublin. The price last year averaged between £7 and £8 per ton under the Free State Government's subsidy scheme, but this year it is not expected to exceed £4 or £4 10s. per ton. Replying to a question in the Dail (Free State Parliament) recently, the Parliamentary Secretary for the Department of Lands and Fisheries said that the official price had not yet been fixed, but owing to a reduction of fifty per cent. in the world price of iodine the prices could not be as high as those paid in previous years.

Prices of Chemical Products

Current Market Conditions

PRICES in the London chemical market remain firm with a good steady demand. Prices of coal tar products on the whole remain unchanged from last week. The general tendency of prices on the Manchester chemical market during the past week has been firm and in several instances values are a shade higher on balance. Actual new business at the present time is on a restricted scale so far as forward buying of any importance is concerned, and the bulk of the transactions since last report has referred to comparatively small parcels. On the whole, however, the quantities moving into consumption in a number of instances represent some slight improvement compared with a month or so ago. Business in the Scottish heavy chemical market still continues steady, and no important change in price is reported. With the following exceptions, the prices of chemical products remain as reported in THE CHEMICAL AGE last week (pages 496-497).

General Chemicals

ACID, CITRIC.—LONDON: 9¾d. per lb.; less 5%. MANCHESTER: 9¾d. to 10d.

ACID, CRESYLIC.—97/99%, 1s. 1d. to 1s. 7d. per gal.; 98/100%, 1s. 5d. to 2s.

ACID, FORMIC.—LONDON: £47 10s. per ton.

ACID, TARTARIC.—11d. per lb. SCOTLAND: B.P. crystals, 10¾d., carriage paid. MANCHESTER: 11½d.

ARSENIC.—LONDON: £19 c.i.f. main U.K. ports for imported material; Cornish nominal, £23 f.o.r mines. SCOTLAND: White powdered, £24 ex wharf. MANCHESTER: White powdered Cornish, £23 10s. at mines.

LEAD NITRATE.—£28 per ton. MANCHESTER: £28 10s.

POTASSIUM CHLORATE.—LONDON: £37 to £40 per ton. SCOTLAND: 99¾/100% powder, £37. MANCHESTER: £37 to £38.

POTASSIUM PRUSSIATE.—LONDON: 8½d. to 9d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.

SULPHATE OF COPPER.—MANCHESTER: £16 10s. per ton f.o.b.

Pharmaceutical and Fine Chemicals

CADMIUM IODIDE.—14s. 6d. per lb.

IRON QUININE CITRATE.—9¾d. to 1s. 0½d. per oz.

SOD. BARBITONUM.—13s. to 15s. per lb.

LINALOL (ex Shui oil).—5s. 9d. per lb.

Essential Oils

ALMOND, FOREIGN S.P.A.—9s. per lb.

BOURBON GERANIUM.—25s. 3d. per lb.

CINNAMON.—3s. 6d. per lb.

CLOVE, 90/92%, English.—4s. 9d. per lb

Coal Tar Products

CREOSOTE.—B.S.I. Specification standard, 3d. per gal. f.o.r. Home, 3¾d. d d. LONDON: 3d. to 3¾d. f.o.r. North; 4d. to 4¼d. London. MANCHESTER: 2¼d. to 3¼d. SCOTLAND: Specification oils, 3¾d. to 4¼d.; washed oil, 4d. to 4¼d.; light, 3¾d. to 4¼d.; heavy, 4¼d. to 5d.

NAPHTHA.—Solvent, 90/160%, 1s. 4d. to 1s. 5d. per gal.; 95/160%, 1s. 7d.; 90/190%, 9d. to 1s. 1d. LONDON: Solvent, 1s. 3¼d. to 1s. 4d.; heavy, 11d. to 1s. 0¼d. f.o.r. SCOTLAND: 90/160%, 1s. 3d. to 1s. 3¼d.; 90/190%, 11d. to 1s. 2d.

PITCH.—Medium soft, £4 5s. per ton. MANCHESTER: £3 15s. to £4 f.o.b. LONDON: £4 to £4 2s. 6d. f.o.b. East Coast port.

PYRIDINE.—90/140, 3s. 9d. to 4s. 6d. per gal.; 90/180, 2s. to 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 3s. to 4s.

XYLOL.—Common, 1s. 10d. to 1s. 11d. per gal.; pure, 2s. 1d. to 2s. 2d.

TOLUOL.—90%, 2s. to 2s. 1d. per gal.; pure, 2s. 4d.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 15s. to £9 per ton. Grey £14 to £15. Liquor, brown, 30° Tw., 6d. per gal. MANCHESTER: Brown, £9 10s.; grey, £15.

New Chemical Trade Marks

Compiled from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2.

Opposition to the registration of the following trade marks can be lodged up to June 24, 1933.

Hortosan. 540,342. Class 2. Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. British Dyestuffs Corporation, Ltd., Imperial Chemical House, Millbank, London, S.W.7. March 29, 1933.

Halidexol. 539,179. Class 3. Chemical substances prepared for use in medicine and pharmacy. British Colloids, Ltd., Crookes Laboratories, Gorst Road, Park Royal, London, N.10. February 17, 1933.

Dettine. 540,545. Class 3. Chemical substances prepared for use in medicine and pharmacy. Reckitt & Sons, Ltd., Kingston Starch Works, Dansom Lane, Hull, Yorkshire. April 6, 1933.

Cafinal. 540,771. Class 3. Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34 Basinghall Street, London, E.C.2. April 18, 1933.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

Brazil.—A firm of commission agents wishes to obtain the representation of manufacturers of copper tubes and galvanised sheets and tubes, and wishes to form a connection with a firm of shippers for gum-arabic, gum tragacanth, red and white lead. (Ref. No. 800.)

Canada.—A firm of wholesale manufacturers' agents handling paper mills' supplies is desirous of securing a United Kingdom agency in respect of china clay of qualities used by paint manufacturers and by firms producing coated paper, barytes, sodium sulphate and alum. The firm is understood to work on a commission basis and cover the manufacturing areas of Eastern Canada. (Ref. No. 759.)

Denmark.—An agent established at Copenhagen wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of transparent wrapping paper. (Ref. No. 773.)

Italy.—An agent established at Genoa wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of oxide of zinc. (Ref. No. 777.)

Roumania.—A commission agent in Cernauti wishes to get into touch with United Kingdom manufacturers and exporters of chemicals, aniline dyes, zinc ingots, pig iron. (Ref. No. 785.)

South Africa.—A well-known London firm of export merchants, with branch establishments in South Africa, seeks the representation of United Kingdom manufacturers of fertilisers. (Ref. No. 767.)

Turkey.—A firm of commission agents in Istanbul desires to obtain agencies of British manufacturers of laboratory instruments, copper, photographic materials, extinguishers, aluminium and aluminium alloys, steel, varnishes and paints, lubricating oils. (Ref. No. 797.)

Forthcoming Events

June 7 to 10.—Textile Institute. Annual conference. Harrogate.

June 10.—Textile Institute. Visit to the laboratories of the Wool Industries Research Association, Torridon, Headingley, Leeds.

June 14.—Electroplaters' and Depositors' Technical Society. Annual Election. "Question" Night. 8.15 p.m. Northampton Polytechnic Institute, St. John Street, Clerkenwell, London.

June 16.—The Physical Society. 5 p.m. Imperial College of Science, South Kensington, London.

New Companies Registered

Classics, Ltd., Dominion House, Bartholomew Close, E.C.1. Registered May 15. Nominal capital £100 in £1 shares. Manufacturers of and dealers in chemicals, gases, drugs, fertilisers, salts, etc. Directors: A. J. Wuertz-Field, Jusan House, Chase Court Gardens, Enfield Chase, C. H. Temple

Elworth Chemical Co., Ltd. Registered May 17. Nominal capital £500 in £1 shares. To acquire the business of a chemical manufacturer carried on by L. K. Ward at Hartford, Northwich, and to carry on the same and the business of manufacturers of and dealers in solder, flux, distilled water, acids. Directors: L. K. Ward, Hillside, Hartford, Ches., K. Twemlow.

R. J. Hamer & Sons, Ltd.—Registered May 24. Nominal capital £25,000 in 20,000 7½ per cent. participating preference shares of £1 each and 100,000 ordinary shares of 1s. each. Manufacturers of paints, cements, tallow greases and other similar substances, rosin distillers and manufacturing chemists, etc. Directors: H. Hays, Lordsbury House, Lordsbury Field, Wallington, Surrey, R. J. Hamer.

Howard Baker (1933), Ltd., Binns Road, Liverpool. Registered May 2. Nominal capital £10,000 in £1 shares. To acquire the business of manufacturers of soap and cleansing commodities now carried on by H. B. (Products), Ltd., and to carry on the business of soap makers, oil refiners and extractors, grease merchants, oil and grease distillers, bone manure manufacturers. Directors: B. H. Baker, Beechwood, Grassendale, Liverpool; G. Elston and C. A. Watson.

Modern Safeglass (Parent), Ltd. Registered May 6. Nominal capital £1,500 in 1s. shares. Objects: To acquire the inventions and processes as to a new type of safe glass, to adopt an agreement with the vendors (not named), and to carry on the business of manufacturers and licensees of safety glass, plasticizers, etc. A subscriber: A. R. Ramer, 110a Wood Vale, Forest Hill, S.E.23. Rotherfield, Sussex, G. R. Cockman, and E. R. Allen.

Refrigeration Patents, Ltd., Imperial Chemical House, Millbank, S.W.1. Registered May 11. Nominal capital £5,000 in 1,110 "A," 1,890 "B" and 2,000 deferred shares, all of £1 each. To adopt agreements (1) with Robert Ducas and Charles Seabrook and (2) J. MacGibbon, F. Pratt.

Southern Rubber Co., Ltd.—Registered May 24. Nominal capital £100 in £1 shares. Manufacturers and preparers of rubber, rubber compounds and articles, manufacturing and analytical chemists, etc. Directors: L. Gilder, 6 Hurlingham Court, S.W.6.

Taylor Page, Ltd., 1-2 Kirkland Place, Greenwich, S.E.10. Registered May 19. Nominal capital £200 in £1 shares. Manufacturers of or dealers in carbides, cyanamide, nitrogen, nitric acid, sulphuric acid, ammonia, etc. Directors: P. L. Taylor, 185 Covington Way, Norbury, S.W.17. W. W. Page.

White Knight Oils, Ltd., "Rock Hill," Horeham Road, East Sussex. Registered May 12. Nominal capital £1,000 in 985 preference shares of £1 each and 300 ordinary shares of 1s. each. Manufacturers of and dealers in oils, greases benzol, motor spirits, tar, bitumen, etc. Directors: C. Somerville, Yew Tree Hill, with Imperial Chemical Industries, Ltd., and John W. Phipps and others, to acquire patents relating to the production, treatment, distribution and use of solid, liquid or gaseous carbon dioxide, drikold, cardice, carbon-ice, carbo-glace and other allied products as refrigerants or for the preservation of foodstuffs, etc. Directors are: R. Ducas, 12 Rue de Monceau, Paris, C. Gray.

Company News

North Broken Hill, Ltd.—A dividend of 5 per cent., payable in Melbourne on June 29, is announced.

British Goodrich Rubber Co., Ltd.—The directors have declared an interim dividend on the ordinary shares of 2½ per cent. actual less tax, on account of the year ending September 30 next.

Fullers' Earth Union.—The profit for the year to March 31 amounted to £11,973, and £2,100 was brought in from the previous year. The ordinary dividend is again 10 per cent., and £1,993 is carried forward.

Doulton & Co., Ltd.—A loss of £8,504 is shown for the year 1932. After charging fees, debenture interest and crediting £13,157 from investment depreciation reserve and £33,541 brought in, there remains to the credit of profit and loss account, £21,929.

Clover Paint & Composition Co., Ltd.—The directors state in a circular to shareholders that having fully considered the company's financial position, they feel that it is in the interests of the company to postpone payment of the preference dividend due on June 1.

Associated Dyers and Cleaners, Ltd.—Against a profit in 1931 of £36,320, the company reports a loss of £48,869 for the past year. After meeting the preference dividend to April 30, 1932, and allowing for the credit of £32,511 brought in, there is a deficit of £24,484, which has been written off from reserve. The annual meeting will be held at Winchester House, London, on June 7, at 11.30 a.m.

Yorkshire Dyeware and Chemical Co.—After providing for depreciation of property, plant and machinery, and all other charges and directors' fees, the surplus for the year ended March 31, 1933, amounts to £23,756. To this is added the balance brought forward, £6,638, making £30,394, less interest on debenture stock, less tax, £3,848, interim dividend, less tax, £3,750, leaving £22,796. The directors recommend a dividend at the rate of 7½ per cent. less tax, £11,250, transfer to reserve £5,000, carrying forward £6,546. The annual meeting will be held at the Great Northern Hotel, Leeds, on June 14, at 12 noon.

Books Received

Spectroscopy in Science and Industry. By S. Judd Lewis. London: Blackie and Son, Ltd. Pp. 94. 3s. 6d.

Official Publications

Lead. Imperial Institute. London: H.M. Stationery Office. Pp. 253. 4s.

SULPHURIC
ALL STRENGTHS
Hydrochloric, Nitric, Dipping, Hydrofluoric, Lactic, Perchloric
F. W. BERK & CO., LTD.
Acid and Chemical Manufacturers since 1870.
106 FENCHURCH ST., LONDON, E.C.3
Telephone: Monument 3874. Wires: Berk, Phone, London.
Works: Stratford, E., and Morriston, Glam.
TAS/Ch.145

OLEUM (all strengths)
Sulphuric, Battery, Dipping, Muriatic, Nitric, and Mixed Acids.
SPENCER CHAPMAN & MESSEL Ltd.
With which is amalgamated WILLIAM PEARCE & SONS, Ltd.
WALSINGHAM HOUSE, SEETHING LANE, E.C.3.
Telephone: Royal 1166. Works: SILVERTOWN, E.16.
Telegrams: "Hydrochloric Fen, London."

PAPER & PAPER CONTAINERS
WATERPROOF PACKINGS
For any climatic conditions from Iceland to Bombay
CREPED OR WAXED LINERS, PAPER SHAVINGS, CORRUGATEDS, etc.
Manufacturers and Agents:
W. K. THOMAS & CO.
CLOCK HOUSE, ARUNDEL STREET, LONDON, W.C.2.
Tel.: Temple Bar 3731. 'Grams: "Plysack Estrand, London,"

GLYCERINE
We supply all grades for pharmaceutical and industrial purposes. May we have your inquiries?
GLYCERINE, LTD.
Unilever House, Blackfriars, London, E.C.4
'Phone: Central 7474. Telegrams: Glymol, Lud, London
GET-2-254